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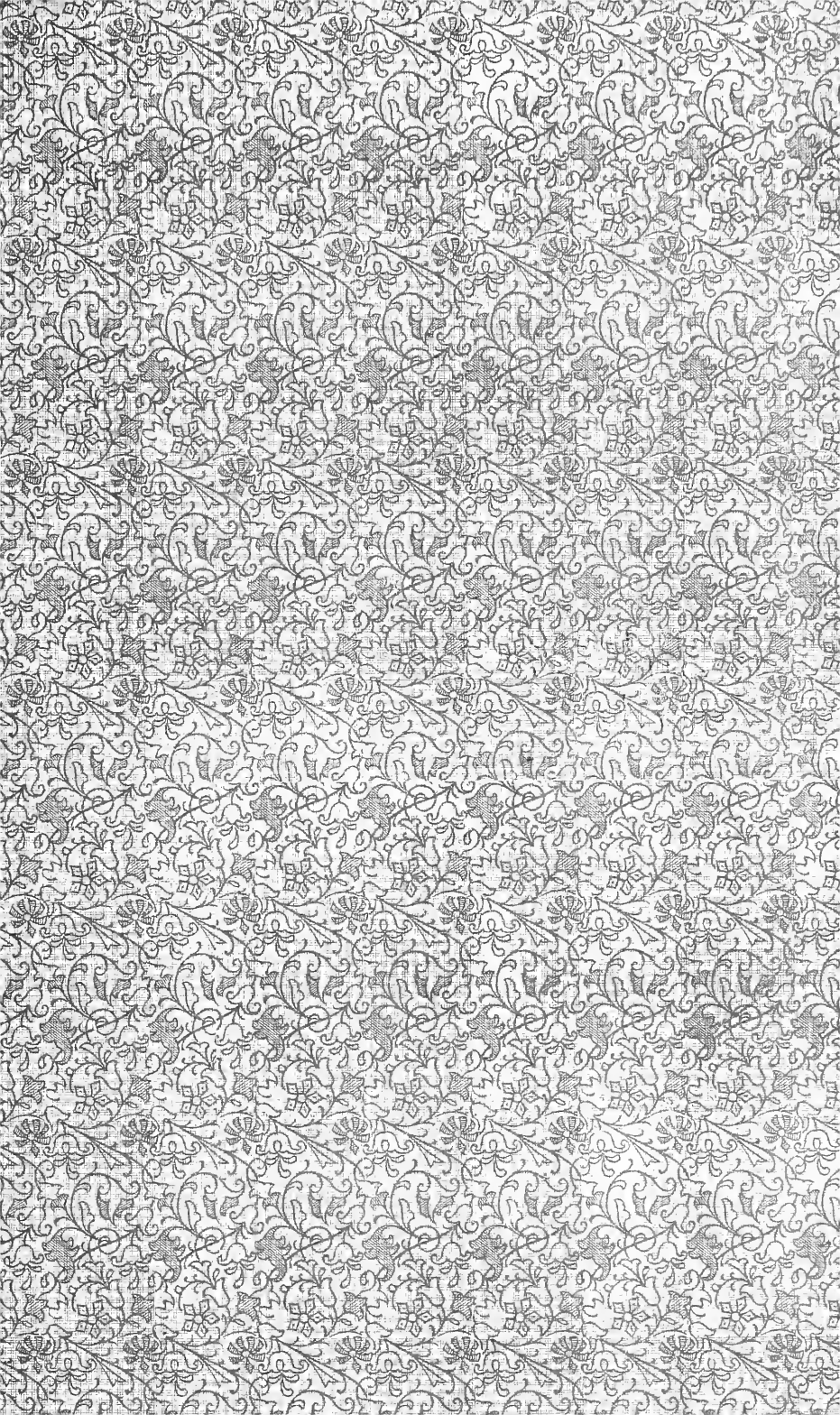


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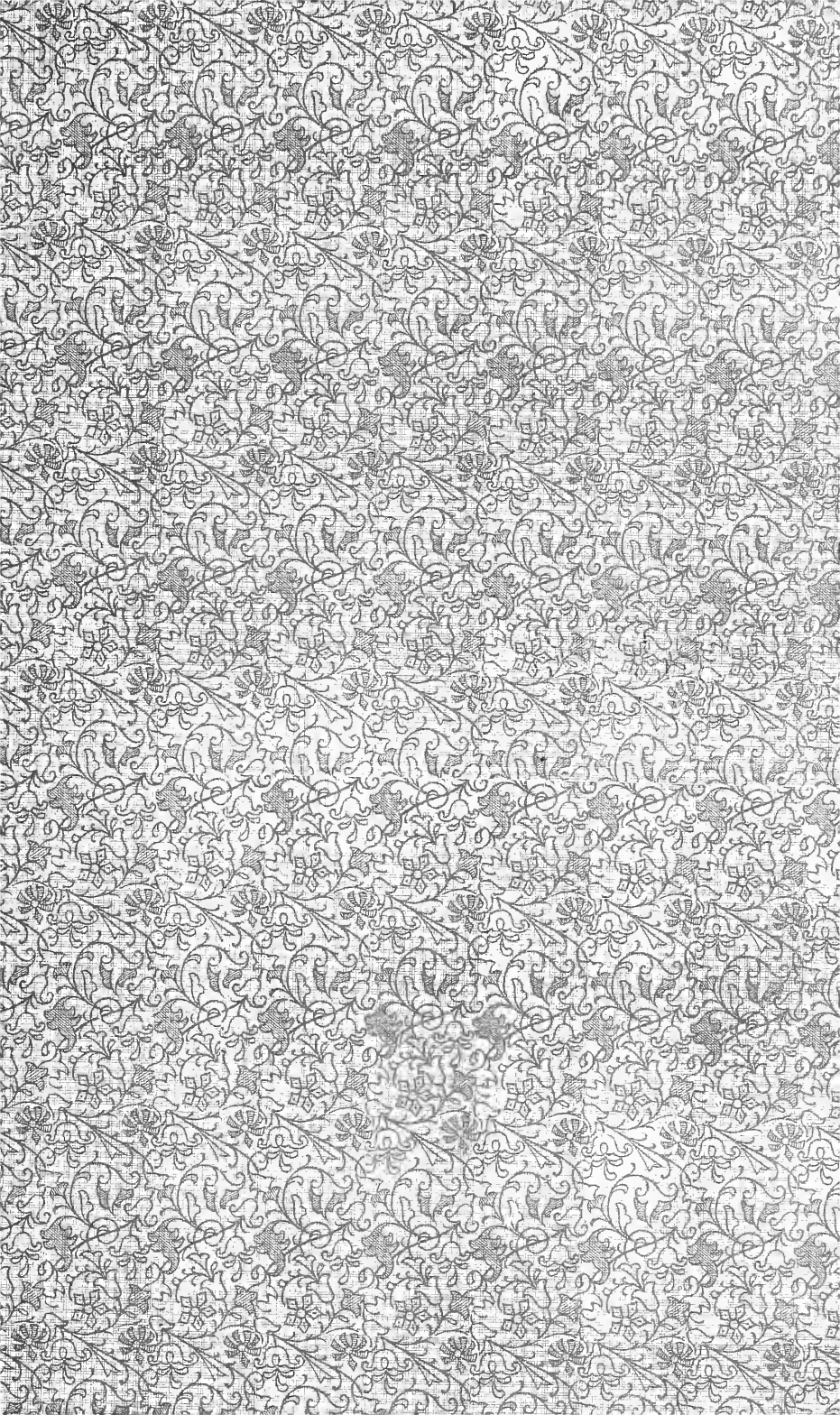
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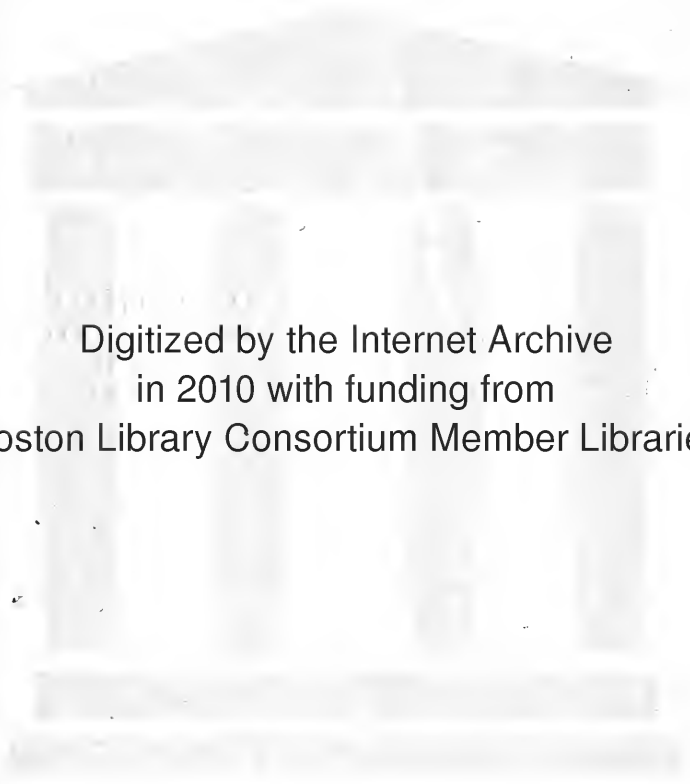
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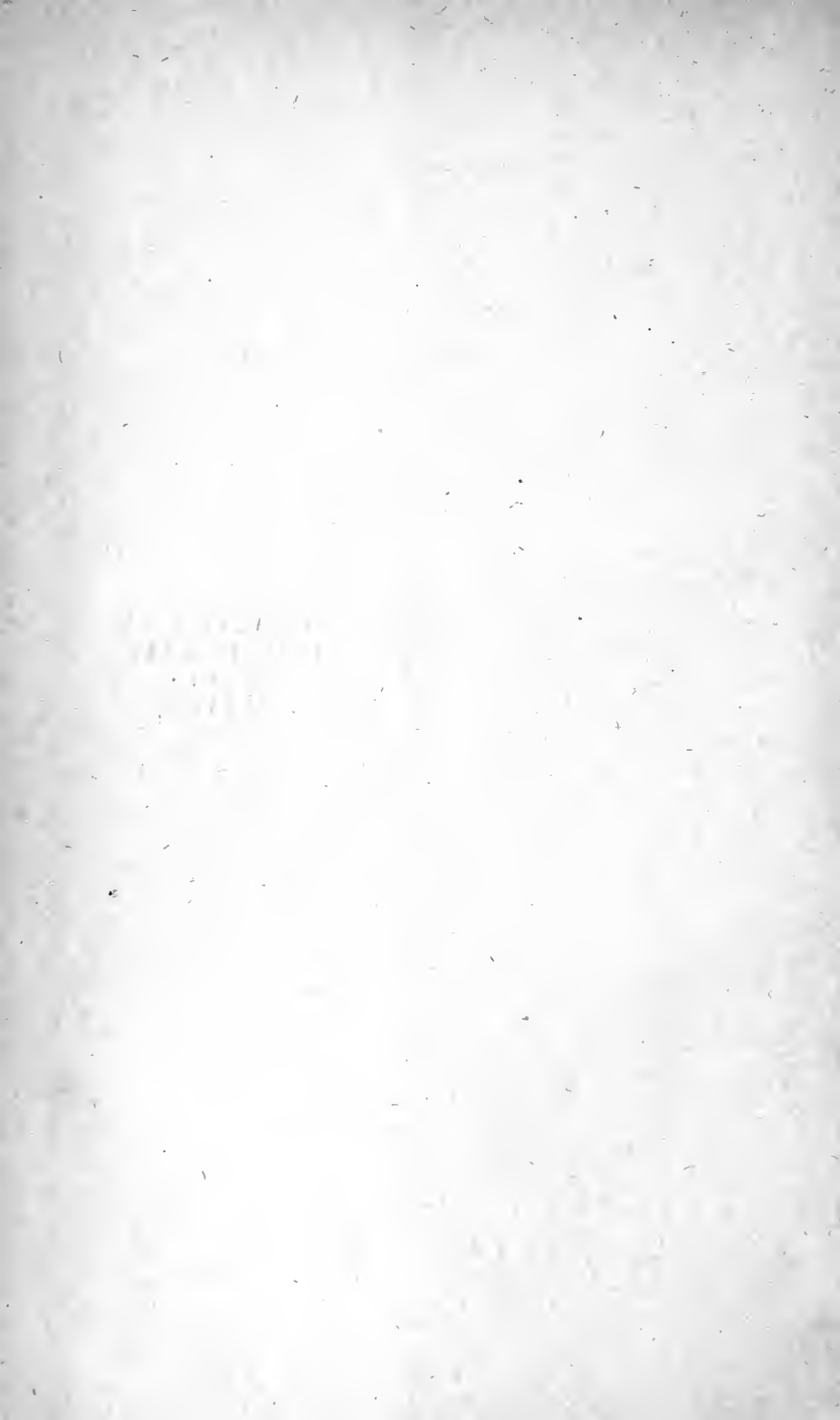




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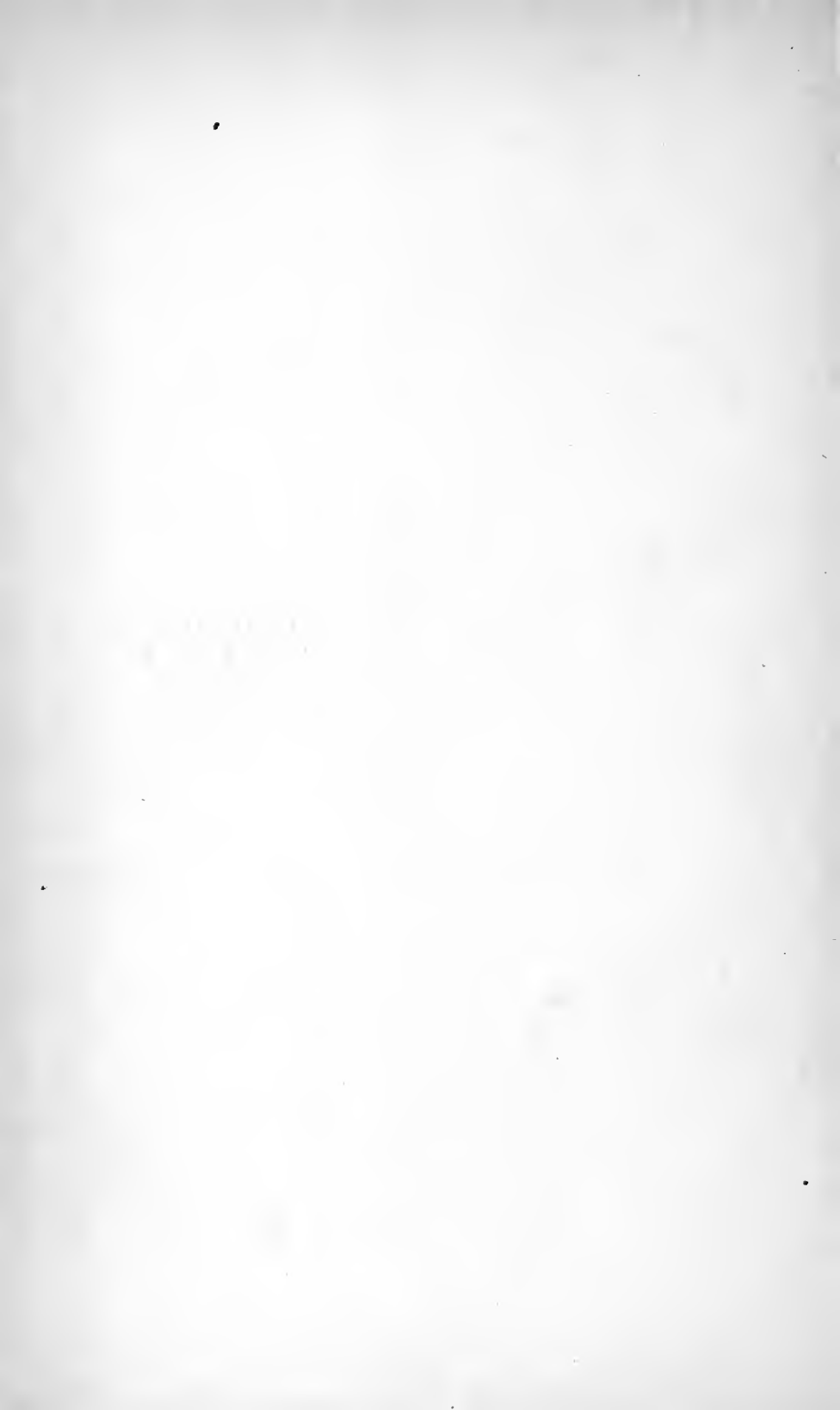
The A. M. S. Bulletin  
Amherst, Mass.



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v. 13

1. Fifty-eighth annual report of the  
Massachusetts Agricultural College.  
Part II.- Catalog of the college for  
1920-1921.
2. Fifty-eighth annual report of the  
Massachusetts Agricultural College.  
Part I.- The report of the President  
and other officers of administration.
3. Not published.
4. Massachusetts Agricultural College  
in the War.
5. Summer Schools, 1921.
6. Announcement of the Two-Year Course  
in Practical Agriculture, 1921-1922.
7. The Ten Weeks' Winter School, 1922.
8. Not published.





PUBLIC DOCUMENT

No. 31

MASSACHUSETTS  
AGRICULTURAL COLLEGE

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CATALOGUE, 1920-1921



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# THE M. A. C. BULLETIN AMHERST, MASSACHUSETTS

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VOLUME XIII JANUARY, 1921 NUMBER I

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PUBLISHED EIGHT TIMES A YEAR BY THE MASSACHUSETTS  
AGRICULTURAL COLLEGE: JAN., FEB., MARCH, MAY,  
JUNE, SEPT., OCT., NOV. ENTERED AT THE POST  
OFFICE, AMHERST, MASS., AS SECOND CLASS MATTER

## THE FIFTY-EIGHTH ANNUAL REPORT OF THE MASSACHUSETTS AGRICULTURAL COLLEGE

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### PART II.—CATALOGUE OF THE COLLEGE FOR 1920-1921



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PUBLICATION OF THIS DOCUMENT  
APPROVED BY THE  
SUPERVISOR OF ADMINISTRATION.



# The Commonwealth of Massachusetts

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MASSACHUSETTS AGRICULTURAL COLLEGE,  
AMHERST, Nov. 30, 1920.

To His Excellency CALVIN COOLIDGE.

SIR: — On behalf of the trustees of the Massachusetts Agricultural College I have the honor to transmit herewith, to Your Excellency and the Honorable Council, Part II of the fifty-eighth annual report of the trustees, this being the catalogue of the college.

I am, very respectfully, your obedient servant,

KENYON L. BUTTERFIELD,  
*President.*

MAY 10 1922



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THE MASSACHUSETTS  
AGRICULTURAL COLLEGE

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Without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life. — *Act of Congress, July 2, 1862.*

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This issue of the catalogue represents the status of the college for the current college year, with provisional announcement of courses of study and other matters for the year to follow. When deemed necessary, additional announcements are made in a supplementary bulletin, published in the spring.

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The college reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue.

# CALENDAR.

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## 1920-21-22.

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### REGULAR AND TWO-YEARS' COURSES.

#### 1920.

September 22-25, Wednesday-Saturday, . . . . .	Entrance examinations.
September 29, Wednesday, 1.30 P.M., . . . . .	Fall term begins; assembly.
October 12, Tuesday, . . . . .	Holiday — Columbus Day.
November 24-26, Wednesday, 12 M.-Friday, 1 P.M., . . . . .	Thanksgiving recess.
December 23, Thursday, 5 P.M., . . . . .	Fall term ends.

#### 1921.

January 3, Monday, 1 P.M., . . . . .	Winter term begins.
February 22, Tuesday, . . . . .	Holiday — Washington's Birthday.
March 25, Friday, 5 P.M., . . . . .	Winter term ends.
April 4, Monday, 1 P.M., . . . . .	Spring term begins.
April 19, Tuesday, . . . . .	Holiday — Patriots' Day.
May 30, Monday, . . . . .	Holiday — Memorial Day.
June 9-14, Thursday-Tuesday, <sup>1</sup> . . . . .	Commencement and fiftieth anniversary celebration.
June 30-July 2, Thursday-Saturday, . . . . .	Entrance examinations.
September 21-24, Wednesday-Saturday, . . . . .	Entrance examinations.
September 28, Wednesday, 1.30 P.M., . . . . .	Fall term begins; assembly.
October 12, Wednesday, . . . . .	Holiday — Columbus Day.
November 23-25, Wednesday, 12 M.-Friday, 1 P.M., . . . . .	Thanksgiving recess.
December 23, Friday, 5 P.M., . . . . .	Fall term ends.

#### 1922.

January 2, Monday, 1 P.M., . . . . .	Winter term begins.
February 22, Wednesday, . . . . .	Holiday — Washington's Birthday.
March 24, Friday, 5 P.M., . . . . .	Winter term ends.
April 3, Monday, 1 P.M., . . . . .	Spring term begins.
April 19, Wednesday, . . . . .	Holiday — Patriots' Day.
May 30, Tuesday, . . . . .	Holiday — Memorial Day.
June 24-27, Saturday-Tuesday, . . . . .	Commencement.
June 29-July 1, Thursday-Saturday, . . . . .	Entrance examinations.
September 20-23, Wednesday-Saturday, . . . . .	Entrance examinations.
September 27, Wednesday, 1.30 P.M., . . . . .	Fall term begins; assembly.

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<sup>1</sup> The normal dates for Commencement would be June 25-28.



## MASSACHUSETTS AGRICULTURAL COLLEGE.

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**HISTORY.** — The Massachusetts Agricultural College was organized under the national land grant act of 1862. This legislation is also known as the Morrill act, the original bill having been framed by Justin Smith Morrill, Senator from Vermont, and its final enactment secured under his leadership. It provided that public lands be assigned to the several States and territories, the funds from the sale of which were to be used to establish and maintain colleges of agriculture and mechanic arts. The Massachusetts Agricultural College is among the first of these institutions established. When this act was passed the Massachusetts Institute of Technology was already organized, and the State of Massachusetts definitely decided that the instruction in the mechanic arts should be at the institute, and that the new institution should confine its work to agriculture. On this account the Massachusetts Agricultural College has the unique distinction of being the only separate agricultural college in the country.

In 1863 the State of Massachusetts accepted the provisions of the Morrill act and incorporated the Agricultural College. The location at Amherst was decided only after long and careful study by the original Board of Trustees. The college was formally opened to students on the 2d of October, 1867, with a faculty of four teachers and with four wooden buildings.

The Massachusetts Legislature has granted money for the erection of practically all of the buildings now on the grounds. In view of the fact that the annual income from the original endowment has been only a few thousand dollars, it has been necessary for the State to assume responsibility for the current expenses of the institution.

**ORGANIZATION.** — The college is a State institution, and as such is subject to the laws governing and the rules applying to all State departments and institutions. The work of the college is directed by a board of eighteen trustees. Four of these are ex-officio members, — the Governor of the State, the Commissioner of Education, the Commissioner of Agriculture and the president of the college. The other fourteen members are appointed by the Governor for terms of seven years each, or two each year. The immediate control of the institution is vested in the president of the college. The various administrative officers, having supervision of the various departments of activity, are directly responsible to the president.

In carrying out its purpose the college has organized three distinct yet correlated types of work, — namely, research, resident instruction and extension service.

**RESEARCH.** — Massachusetts provided for the establishment of an agricultural experiment station in 1882. This station, though on the college grounds and supported by the State, was without organic connection with the college. Under an act of Congress, passed in 1887, an agricultural experiment station was established and supported as a department of the college.

For a time, therefore, Massachusetts had two experiment stations at the college. In 1894 these were combined, and the station reorganized as a department of the college. It is now supported by funds from both the State and the Federal government. In 1906 the Federal government largely increased its support on condition that the money thus provided should be used only for research. The station now receives about three-fourths of its support from the State.

The station is under the direct supervision of the Board of Trustees; the chief officer is the director, who is responsible to the president. It is organized into a number of departments, all co-operating toward the betterment of agriculture. In most cases the heads of these departments are heads of corresponding departments in the college. The station publishes numerous bulletins and two annual reports, one scientific, the other popular. These publications are free and circulate extensively, the mailing list containing approximately 20,000 addresses.

**RESIDENT INSTRUCTION.** — The college offers an education without tuition fee to any student who is a resident of Massachusetts and who meets the requirements for admission. Women are admitted on the same basis as are men. Students who are not residents of Massachusetts are required to pay a nominal tuition fee. The chief aim of the institution, through its resident instruction, is to prepare men and women for the agricultural vocations. The term "agricultural vocations" is here used in its broadest sense. Courses are offered which give efficient training in various agricultural pursuits, such as general farming, dairying, management of estates, poultry husbandry, fruit growing, market gardening, floriculture, landscape gardening and forestry. Students are also trained for investigation in many sciences underlying the great agricultural industry, for teaching in agricultural colleges and high schools, and for scientific work in chemistry, entomology, botany and microbiology.

Though training for the agricultural vocations is thus the chief concern of the college, students should find the course one that trains them admirably for pursuits in which the sciences are an essential preparation. The course of study aims also to combine an adequate general education with specialized technical and practical training.

**FOUR-YEAR COURSES.** — Twenty-nine teaching departments offer instruction in agriculture, horticulture, sciences, the humanities, rural social science and rural home making. A system of major courses permits the student to elect major work in one of eighteen departments, and to specialize in it and allied subjects for a period of two years. The degree of bachelor of science is granted on the satisfactory completion of the four years' work of collegiate grade.

**SHORT COURSES.** — In order to extend the advantages of the institution to those men and women who cannot or do not care to take advantage of the four-year course, various short courses are offered. Chief among these are a two-year course in practical agriculture, a summer school of agriculture and country life, and a winter school of agriculture.

**GRADUATE SCHOOL.** — The graduate school is organized to provide the necessary training for scientific leadership in agriculture and allied sciences. The degrees of master of agriculture, master of landscape architecture, master of science, doctor of agriculture and doctor of philosophy may be earned upon the completion of satisfactory study, research and thesis.

**THE EXTENSION SERVICE.** — The extension service is an organized effort to carry systematic and dignified instruction to the thousands of people throughout the State who are unable, for various reasons, to take advantage of the regular courses offered at the college. It is in reality the "carrying of the college to the people of the State." Every department of the institution, in so far as the regular teaching and research work will permit, contributes what it can to this work. There is also a regular staff of extension workers whose sole business it is to present the instruction of the college to individuals and various organizations throughout the State.

**LOCATION AND EQUIPMENT.** — The Agricultural College is located in the town of Amherst. The grounds comprise more than 600 acres, lying about a mile north of the village center. The college has also a demonstration forest of 755 acres, located 6 miles north of the campus. The equipment of the college, both in buildings and facilities for instruction, is excellent. Amherst is 97 miles from Boston, and may be reached by the Central Massachusetts division of the Boston & Maine Railroad, or by the Central Vermont Railroad. Electric car lines connect Amherst with Northampton, Holyoke and Springfield.

**MILITARY DRILL.** — By Federal law military drill is required of all regular students attending the Massachusetts Agricultural College.

## THE CORPORATION.

### ORGANIZATION OF 1920.

#### MEMBERS OF THE CORPORATION.

	TERM EXPIRES
ELMER D. HOWE of Marlborough, . . . . .	1921
EDMUND MORTIMER of Grafton, . . . . .	1921
NATHANIEL I. BOWDITCH of Framingham, . . . . .	1922
WILLIAM WHEELER of Concord, . . . . .	1922
CHARLES A. GLEASON of New Braintree, . . . . .	1923
JAMES F. BACON of Boston, . . . . .	1923
FRANK GERRETT of Greenfield, . . . . .	1924
HAROLD L. FROST of Arlington, . . . . .	1924
CHARLES H. PRESTON of Danvers, . . . . .	1925
CARLTON D. RICHARDSON of West Brookfield, . . . . .	1925
DAVIS R. DEWEY of Cambridge, . . . . .	1926
JOHN F. GANNON of Pittsfield, . . . . .	1926
ARTHUR G. POLLARD of Lowell, . . . . .	1927
GEORGE H. ELLIS of West Newton, . . . . .	1927

#### MEMBERS EX OFFICIO.

His Excellency Governor CALVIN COOLIDGE, *President of the Corporation.*  
 KENYON L. BUTTERFIELD, *President of the College.*  
 PAYSON SMITH, *State Commissioner of Education.*  
 ARTHUR W. GILBERT, *State Commissioner of Agriculture.*

#### OFFICERS OF THE CORPORATION.

His Excellency Governor CALVIN COOLIDGE of Northampton, *President.*  
 CHARLES A. GLEASON of New Braintree, *Vice-President.*  
 RALPH J. WATTS of Amherst, *Secretary.*  
 FRED C. KENNEY of Amherst, *Treasurer.*  
 CHARLES A. GLEASON of New Braintree, *Auditor.*

#### STANDING COMMITTEES OF THE CORPORATION.<sup>1</sup>

##### *Committee on Finance.*

CHARLES A. GLEASON, *Chairman.*  
 GEORGE H. ELLIS.  
 NATHANIEL I. BOWDITCH.

ARTHUR G. POLLARD.  
 CARLTON D. RICHARDSON.  
 EDMUND MORTIMER.

##### *Committee on Course of Study and Faculty.*

WILLIAM WHEELER, *Chairman.*  
 ELMER D. HOWE.  
 PAYSON SMITH.

DAVIS R. DEWEY.  
 JOHN F. GANNON.  
 JAMES F. BACON.

##### *Committee on Farm.*

NATHANIEL I. BOWDITCH, *Chairman.*  
 FRANK GERRETT.  
 CARLTON D. RICHARDSON.

GEORGE H. ELLIS.  
 EDMUND MORTIMER.  
 ARTHUR W. GILBERT.

<sup>1</sup> The president of the college is ex-officio member of each committee.



*Committee on Horticulture.*HAROLD L. FROST, *Chairman.*

CHARLES A. GLEASON.

EDMUND MORTIMER.

ELMER D. HOWE.

ARTHUR W. GILBERT.

CHARLES H. PRESTON.

*Committee on Experiment Department.*CHARLES H. PRESTON, *Chairman.*

ARTHUR W. GILBERT.

ARTHUR G. POLLARD.

HAROLD L. FROST.

EDMUND MORTIMER.

*Committee on Buildings and Arrangement of Grounds.*FRANK GERRETT, *Chairman.*

WILLIAM WHEELER.

CHARLES H. PRESTON.

GEORGE H. ELLIS.

JAMES F. BACON.

*Committee on Extension Service.*ELMER D. HOWE, *Chairman.*

GEORGE H. ELLIS.

HAROLD L. FROST.

DAVIS R. DEWEY.

NATHANIEL I. BOWDITCH.

JOHN F. GANNON.

ARTHUR W. GILBERT.

## OFFICERS OF THE INSTITUTION.

As of Nov. 30, 1920.

### OFFICERS OF GENERAL ADMINISTRATION.

KENYON L. BUTTERFIELD, A.M., LL.D.,	President of the College.	President's House.
GEORGE M. CAMPBELL, B.Sc.,	Field Agent.	83 Pleasant Street.
CHARLES H. FERNALD, Ph.D.,	Honorary Director of the Graduate School.	3 Hallock Street.
CHARLES R. GREEN, B.Agr.,	Librarian.	Mount Pleasant.
PHILIP B. HASBROUCK, B.Sc.,	Registrar.	31 Fearing Street.
SIDNEY B. HASKELL, B.Sc.,	Director of the Experiment Station.	Mount Pleasant.
FRED C. KENNEY,	Treasurer of the College.	Mount Pleasant.
EDWARD M. LEWIS, A.M.,	Dean of the College.	19 Lincoln Avenue.
CHARLES E. MARSHALL, Ph.D.,	Director of the Graduate School.	44 Sunset Avenue.
JOHN PHELAN, A.M.,	Director of Short Courses.	5 Mount Pleasant.
RALPH J. WATTS, B.Sc.,	Secretary of the College.	101 Butterfield Terrace.
JOHN D. WILLARD, B.A.,	Director of the Extension Service.	East Pleasant Street.

### THE FACULTY OF INSTRUCTION.

KENYON L. BUTTERFIELD, A.M., LL.D.,	President of the College and Head of the Division of Rural Social Science.	President's House.
CHARLES H. ABBOTT, Ph.D.,	Instructor in Zoölogy.	3 Dana Street.
MAX F. ABELL, B.Sc.,	Assistant Professor of Farm Management.	North Amherst.
PAUL J. ANDERSON, Ph.D.,	Professor of Botany.	25 Lincoln Avenue.
EDGAR L. ASHLEY, A.M.,	Professor of German.	24 Pleasant Street.
LUTHER BANTA, B.Sc.,	Assistant Professor of Poultry Husbandry.	70 Lincoln Avenue.
ARTHUR B. BEAUMONT, Ph.D.,	Professor of Agronomy and Head of Department.	51 Amity Street.
ALEXANDER E. CANCE, Ph.D.,	Professor of Agricultural Economics and Head of Department.	9 Fearing Street.
JOSEPH S. CHAMBERLAIN, Ph.D.,	Professor of Organic and Agricultural Chemistry.	Mount Pleasant.

WALTER W. CHENOWETH, M.Sc.,	North Amherst.
Professor of Horticultural Manufactures and Head of Department.	
FRANCIS P. CLARK, B.Sc.,	24 Pleasant Street.
Instructor in Mathematics.	
ORTON L. CLARK, B.Sc.,	16 College Street.
Assistant Professor of Botany.	
GUY C. CRAMPTON, Ph.D.,	116 Pleasant Street.
Professor of Insect Morphology.	
ARTHUR L. DACY, B.Sc.,	2 Allen Street.
Professor of Vegetable Gardening.	
WILLIAM L. DOWD, B.Sc., <sup>1</sup>	North Amherst.
Instructor in Entomology.	
BROOKS D. DRAIN, B.Sc.,	24 Pleasant Street.
Assistant Professor of Pomology.	
HENRY T. FERNALD, Ph.D.,	44 Amity Street.
Professor of Entomology, Head of Department, Chairman of Division of Science.	
JAMES A. FOORD, M.Sc.,	54 Lincoln Avenue.
Professor of Farm Management, Head of Department, Head of Division of Agriculture.	
WILLARD K. FRENCH, B.Sc.,	24 Pleasant Street.
Assistant Professor of Farm Management.	
GEORGE E. GAGE, M.A., Ph.D.,	The Davenport.
Professor of Animal Pathology.	
HELENA T. GOESSMAN, M.Ph.,	21 Pleasant Street.
Instructor of English.	
CLARENCE E. GORDON, Ph.D.,	38 Lincoln Avenue.
Professor of Zoölogy and Geology and Head of Department.	
HAROLD M. GORE, B.Sc.,	The Davenport.
Assistant Professor of Physical Education.	
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JOHN C. GRAHAM, B.Sc.,	68 Lincoln Avenue.
Professor of Poultry Husbandry and Head of Department.	
EMORY E. GRAYSON, B.Sc.,	Belchertown.
Instructor in Physical Education.	
LAURENCE R. GROSE, A.B., M.F.,	45 Amity Street.
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MARGARET HAMLIN, B.A.,	12 North East Street.
Agricultural Counsellor for Women.	
ELMER A. HARRINGTON, A.M., Ph.D.,	7 Allen Street.
Professor of Physics.	
ROY D. HARRIS, B.Sc.,	Care of Mrs. H. D. Fearing.
Instructor in Market Gardening.	
ARTHUR K. HARRISON,	6 Allen Street.
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WILLIAM R. HART, LL.B., M.A.,	97 Pleasant Street.
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Professor of Physics and Head of Department.	
CURRY S. HICKS, B.Pd.,	The Davenport.
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ARTHUR N. JULIAN, A.B.,	4 Farview Way.
Assistant Professor of German.	

<sup>1</sup> Temporary position.

EDWARD M. LEWIS, A.M.,	19 Lincoln Avenue.
Professor of Languages and Literature, Head of Department, Acting Head of Division of the Humanities.	
JOSEPH B. LINDSEY, Ph.D.,	47 Lincoln Avenue.
Goessmann Professor of Agricultural Chemistry and Head of Department.	
WILLIAM P. B. LOCKWOOD, M.Sc.,	34 North Prospect Street.
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WILLIAM L. MACHMER, A.M.,	3 Kendrick Place.
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ALEXANDER A. MACKIMMIE, A.M.,	Pine Street, North Amherst.
Professor of French.	
CHARLES E. MARSHALL, Ph.D.,	44 Sunset Avenue.
Professor of Microbiology and Head of Department.	
FREDERICK A. McLAUGHLIN, B.Sc.,	15 Fearing Street.
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Assistant Professor of Citizenship and Acting Head of Department of Economics and Sociology.	
CHARLES H. PATTERSON, A.M.,	26 Lincoln Avenue.
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PAUL SEREX, M.Sc.,	5 East Pleasant Street.
Assistant Professor of Chemistry.	

<sup>1</sup> On leave of absence.

FREDERICK E. SHNYDER, Major, Cavalry, U. S. A., . . . . .	Amherst House.
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NEWELL L. SIMS, A.M., Ph.D., . . . . .	60 Pleasant Street.
Professor of Rural Sociology.	
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Professor of Home Economics, Head of Department, Adviser of Women.	
ROBERT J. SPRAGUE, Ph.D., <sup>1</sup> . . . . .	Mount Pleasant.
Professor of Economics and Sociology and Head of Department.	
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Instructor in Agronomy.	
CLARK L. THAYER, B.Sc., . . . . .	The Davenport.
Professor of Floriculture and Head of Department.	
WESTON C. THAYER, B.Sc., . . . . .	14 Nutting Avenue.
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GUY A. THELIN, B.Sc., . . . . .	24 Pleasant Street.
Instructor in Agronomy.	
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ALFRED L. TOWER, B.Sc., . . . . .	Mount Pleasant.
Instructor in Physics.	
GLEN E. UPTON, B.Sc., . . . . .	24 Pleasant Street.
Instructor in Dairying.	
RICHARD W. WALKER, U. S. A., Lieut.-Col., Cavalry, U. S. A., . . . . .	Mount Pleasant.
Professor of Military Science and Tactics.	
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— . . . . .	—
Assistant Professor of Agronomy.	
— . . . . .	—
Professor of English.	
— . . . . .	—
Professor of Chemistry.	
— . . . . .	—
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Instructor in Agronomy.	
Mrs. ELSIE V. CROCKER, . . . . .	North Amherst.
Clerk.	

<sup>1</sup> On leave of absence.

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Instructor in Dairying.	
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Head of Division of Horticulture.	
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Investigator in Entomology.	

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<sup>1</sup> On leave of absence.

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Extension Professor of Soils and Crops.	

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VIOLA DAMON,	Bank Block.
Stenographer, Division of Horticulture.	

<sup>1</sup> Appointment effective Jan. 1, 1921.<sup>2</sup> Temporary position.



EMILY G. DAVIDSON,	10 Maple Street.
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SADIE SHORES,	35 South Pleasant Street.
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DORIS TOWER,	55 Amity Street.
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OLIVE M. TURNER, B.Sc.,	22 Spaulding Street.
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CATHERINE WHITE,	East Pleasant Street.
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_____	_____
Stenographer, Department of Dairying.	
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## THE LIBRARY STAFF.

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Assistant to Military Detail.	
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Laboratory Assistant, Department of Horticultural Manufactures.	
ENOS J. MONTAGUE, B.Sc., . . . . .	Campus.
Farm Superintendent.	
ADELBERT SHEFFIELD, . . . . .	North Amherst.
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JAMES WHITING, . . . . .	16 Hallock Street.
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## GRADUATE ASSISTANTS.

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AMBROSE C. FANEUF, B.Sc., . . . . .	Chemistry Building.
Department of Chemistry.	
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1920-21.

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# THE COLLEGE

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## ADMISSION.

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### A. APPLICATION FOR ADMISSION.

**All correspondence concerning admission should be addressed to the registrar.**

Every applicant for admission to the college must be at least sixteen years old, and must present to the registrar proper testimonials of good character. Such testimonials, whenever possible, should come from the principal of the school at which the applicant has prepared for college. Candidates who desire to present themselves for examination in any subjects must make application to the college for such privilege at least one month before examination is desired. Blanks for such application may be obtained by addressing the registrar of the college. All entrance credentials must be in the hands of the registrar before the applicant can matriculate.

### B. MODES OF ADMISSION.

Students are admitted to the freshman class either upon certificate or upon examination. No *diploma* from a secondary school will be accepted.

**CERTIFICATES.** — Certificates will be received from those schools in New England which have been approved by the New England College Entrance Certificate Board. Principals of schools in New England who desire the certificate privilege should address the secretary of the Board, Professor Frank W. Nicolson, Wesleyan University, Middletown, Conn. Certificates from schools outside of New England may be received if those schools are on the approved list of the leading colleges of the section in which the school in question is located.

The credentials of the Board of Regents of the State of New York are accepted as satisfying the entrance requirements of this college when offered subject for subject.

Certificates in order to be accepted must present at least three of the necessary fourteen credits. It is to be understood, however, that responsibility for certification in either elementary French, elementary German, English 1 or English 2, Latin A, Greek A or algebra must be assumed by one school, if the candidate has received his preparation in any one subject named above in more than one school. Subjects lacking on certificate (except for the permitted number of conditions) must be made up at the time of the examinations for admission.

Blank forms for certification — sent to principals or school superintendents only — may be obtained on application to the registrar of the college.

**EXAMINATIONS.** — The examination in each subject may be oral or written, or both. The standard required for passing an examination for admission is 65 per cent. Conditions to the amount of two units will be allowed.

Entrance examination for admission to the Massachusetts Agricultural College will be held at the following centers: —

In June, . . . . . Amherst, Department of Physics building.  
Massachusetts Institute of Technology,  
Cambridge, Mass.  
Worcester, Horticultural Hall.

In September, . . . . . Amherst, Department of Physics building.

**Please note that September examinations are held in Amherst only.**

*Schedule for Entrance Examinations, June 30-July 2, inclusive, 1921.* —  
The examinations in June will follow this schedule: —

*First Day.*

7.45 A.M. Registration.  
8.00 A.M. Plane geometry.  
10.00 A.M. Chemistry.  
11.30 A.M. Botany.  
2.00 P.M. Solid geometry.  
4.00 P.M. Physics.

*Second Day.*

8.00 A.M. English 1 and 2.  
11.00 A.M. Algebra.  
2.00 P.M. History (ancient; medieval and modern; English; general; United States and civics).

*Third Day.*

8.00 A.M. French, German, Spanish, required and elective.  
1.00 P.M. Latin, elementary, intermediate and advanced, and all one-half credit electives, except those already noted.

*Schedule for Entrance Examinations in September.* — In September, 1921, the examinations will be given September 21-24, inclusive, and will follow the order indicated below: —

*First Day.*

1.00 P.M. Registration.  
1.15-5.00 P.M. Greek, elementary and intermediate.

*Second Day.*

8.00 A.M. Plane geometry.  
10.00 A.M. Chemistry.  
11.30 A.M. Botany.  
2.00 P.M. Solid geometry.  
4.00 P.M. Physics.

*Third Day.*

8.00 A.M. English 1 and 2.  
11.00 A.M. Algebra, agriculture.  
2.00 P.M. History (ancient; medieval and modern; English; general; United States and civics).



*Fourth Day.*

8.00 A.M. French, German, Spanish, required and elective.

1.00 P.M. Latin, elementary, intermediate and advanced, and all one-half credit electives, except those already noted.

## C. REQUIREMENTS FOR ADMISSION.

The requirements for admission are based on the completion of a four-year high school course, or its equivalent, and are stated in terms of units. The term unit means the equivalent of at least four recitations a week for a school year.

Fourteen and one-half units must be offered for admission in accordance with the entrance requirements as stated below. Entrance credits gained either by certificate or by examination will hold good for one year.

*Entrance Requirements.*1. *Prescribed.* — The following units are prescribed: —

English 1, . . . . .	1½
English 2, . . . . .	1½
A foreign language, . . . . .	2
Algebra, . . . . .	1½
Plane geometry, . . . . .	1
	<hr/>
	7½

2. *Restricted Electives.* — Three units to be selected from —

Science, . . . . .	1, 2 or 3
History (American history and civics included), . . . . .	1, 2 or 3
A second foreign language, . . . . .	2 or 3
Additional work in first foreign language, . . . . .	1 or 2.

3. *Free Margin.* — Free margin of four units to consist of any substantial work (including agriculture,<sup>1</sup> general science and a fourth year of English) for which credit of not less than one-half unit earned in one year is given toward a secondary school diploma.

Units presented in the free margin group are not to be offered by examination or by certificate, but presented by submitting a principal's statement to the effect that such units have been earned in a secondary school, and have been credited toward a diploma issued by such a school.

4. One unit of history must be offered in either the restricted electives or the free margin.

5. If elementary algebra and plane geometry are counted as three units, the total requirement will be fifteen units.

6. Both the credits under the prescribed group and the restricted elective group must be presented either by certificate from an approved school or by examination, or by a combination of both.

The following is a list of subjects in which the entrance credits must be offered in the prescribed and restricted elective groups: —

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<sup>1</sup> See page 32 for details.

*Mathematics and Science.*

Botany, <sup>1</sup>	1/2 or 1
Chemistry, <sup>1</sup>	1
Algebra,	1 1/2
Plane geometry,	1
Solid geometry,	1/2
Trigonometry,	1/2
Physics, <sup>1</sup>	1
Geology,	1/2
Physical geography,	1/2
Physiology,	1/2
Zoölogy, <sup>1</sup>	1/2

*History.*

Ancient,	1
Medieval and modern,	1
English,	1
General,	1
United States and civics,	1

*English.*

English 1,	1 1/2
English 2,	1 1/2

*Foreign Language.*

Elementary French,	2
Elementary German,	2
Elementary Spanish,	2
Elementary Latin,	2
Elementary Greek, <sup>2</sup>	2
Intermediate French,	1
Intermediate German,	1
Intermediate Spanish,	1
Intermediate Latin,	1
Intermediate Greek, <sup>2</sup>	1
Advanced French,	1
Advanced German,	1
Advanced Spanish,	1
Advanced Latin,	1

No applicant deficient in both algebra and plane geometry will be admitted.

**PRESENTATION OF NOTE-BOOKS.**—The keeping of a note-book is required as part of the preparation in those subjects indicated (see note 2, below).

Candidates presenting themselves for examination in such subjects must present at the same time the required note-book, properly certified by the principal. Candidates presenting such subjects on certificates should not present note-books; but their certificates must state that note-books have been satisfactorily completed.

#### D. STATEMENT OF PREPARATION REQUIRED FOR ADMISSION.

AGRICULTURE. — Entrance credit in agriculture is granted on the following basis:—

I. The Massachusetts Agricultural College accepts a maximum of four credits in agriculture from any secondary, or county agricultural, high school in Massachusetts offering work in that subject, provided evidence of such

<sup>1</sup> Note-book required as part of the preparation will be credited as part of the examination.

<sup>2</sup> Examination in September only.

work having been done is submitted on a principal's statement, as is indicated in the "free margin" group.

II. In high schools organizing agricultural club work under the supervision and rules of the junior extension service of the college, one credit is granted for each full year of work performed under the following plan: —

*Work of the Winter Term.* — (a) The study of textbooks such as are suitable for secondary school instruction in agriculture.

(b) Course of Study: A general outline of suggested topics for study.

(c) Visits by a representative of the Massachusetts Agricultural College for observation, counsel and advice in regard to kind and amount of work being done in agriculture.

(d) Formation of an agricultural club with officers from among its own members, meeting once a month under local supervision of some one authorized to act for the school authorities.

*Work of the Spring Term.* — Same in general form as winter term.

*Work of the Summer Term.* — An approved project conforming to the rules of some one or more of the agricultural clubs of the junior extension service of the Massachusetts Agricultural College.

*Work of the Fall Term.* — (a) An exhibit of work.

(b) Reports and story of achievement submitted to the junior extension service of the college.

**The maximum number of credits in agriculture is four. The examinations in agriculture are given in September only.**

**BOTANY.** — For one unit of credit in botany, the work outlined in the statement of requirements issued by the College Entrance Examination Board, or its equivalent, will be accepted. This work should occupy one school year and include laboratory and supplementary text-book study. For one-half unit of credit, work that covers the same ground but occupies half the time required for a full unit of credit will be accepted. These requirements are met by such texts as Stevens "Introduction to Botany" and Bergen & Davis "Principles of Botany." A note-book containing neat, accurate drawings and descriptive records forms part of the requirement for either the half-unit or the one-unit credit, and this note-book must be presented by all applicants for admission upon examination in this subject. The careful preparation of an herbarium is recommended to all prospective students of this college, although the herbarium is not required.

**CHEMISTRY.** — The entrance examination in chemistry will cover the work outlined by the College Entrance Examination Board as preparatory for college entrance. In general, this consists of a year of high school chemistry from any standard textbook, with laboratory work on the properties of the common elements and their simpler compounds. No particular work is prescribed. The keeping of a note-book is required.

**MATHEMATICS.** — (a) *Required.* — Algebra: The four fundamental operations for rational algebraic expressions; factoring, determination of highest common factor and lowest common multiple by factoring; fractions, including complex fractions; ratio and proportion; linear equations, both numerical and literal, containing one or more unknown quantities; problems depending on linear equations; radicals, including the extraction of the square root of polynomials and numbers; exponents, including the fractional and negative; quadratic equations, both numerical and literal; simple cases of equations with one or more unknown quantities that can be solved by the methods of

linear or quadratic equations; problems depending upon quadratic equations; the binomial theorem for positive integral exponents, the formulas for the  $n$ th term and the sum of the terms of arithmetic and geometric progressions, with applications.

**Plane Geometry:** The usual theorems and constructions of good textbooks, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle; the solution of numerous original exercises, including loci problems; applications to the mensuration of lines and plane surfaces.

(b) *Elective.* — **Solid Geometry:** The usual theorems and constructions of good textbooks, including the relations of planes and lines in space; the properties and measurement of prisms, pyramids, cylinders and cones; the sphere and spherical triangle; the solution of numerous original exercises, including loci problems; applications to the mensuration of surfaces and solids.

**Plane Trigonometry:** A knowledge of the definitions and relations of trigonometric functions and of circular measurements and angles; proofs of the principal formulas and the application of these formulas to the transformation of the trigonometric functions; solution of trigonometric equations, the theory and use of logarithms, and the solution of right and oblique triangles.

**PHYSICS.** — To satisfy the entrance requirement in physics, the equivalent of at least one unit of work is required. This work must consist of both class-room work and laboratory practice. The work covered in the class-room should be equal to that outlined in Hall & Bergen's "Textbook of Physics" or Millikan & Gale; the laboratory work should represent at least thirty-five experiments involving careful measurements, with accurate recording of each in laboratory note-book. This note-book, certified by the instructor in the subject, must be submitted by each candidate presenting himself for examination in physics; credit for passing the subject will be given on laboratory notes and on the examination paper submitted. Candidates entering on certificate will not be required to present note-books, but the principal's certification must cover laboratory as well as class-room work.

**PHYSIOLOGY.** — Hough & Sedgwick's "The Human Mechanism;" Martin's "The Human Body; Briefer Course."

**ZOOLOGY, PHYSICAL GEOGRAPHY, GEOLOGY.** — The following suggestions are made concerning preparation for admission in the subjects named above: —

For physiography, Davis' "Elementary Physical Geography;" Gilbert & Brigham's "Introduction to Physical Geography." For zoölogy, textbooks entitled "Animals" or "Animal Studies," by Jordan, Kellogg and Heath; Linville & Kelley's "A Textbook in General Zoölogy." For geology, A. P. Brigham's "A Textbook of Geology" or Tarr's "Elementary Geology."

Applicants for examination in zoölogy are *required* to present certified laboratory note-books; applicants for examination in the other subjects are *advised* to present note-books, if laboratory work has been done. Good note-books may be given credit for entrance. Examination in these subjects will be general, in recognition of the different methods of conducting courses; but students will be examined on the basis of the most thorough secondary school courses.

**HISTORY.** — The required unit must be offered in either ancient history, medieval and modern history, English history, general history, or United

States history and civics. Either one, two or three elective units in any of the historical subjects here named may be offered, provided that no unit be offered in the same subject in which the required unit has been offered.

Preparation in history will be satisfactory if made in accordance with the recommendations of the committee of seven of the American Historical Association, as outlined by the College Entrance Examination Board. The examination will require comparisons and the use of judgment by the candidate rather than the mere use of memory, and it will presuppose the use of good textbooks, collateral reading and practice in written work. Geographical knowledge may be tested by requiring the location of places and movements on outline maps.

To indicate in a general way the character of the text-book work expected, the texts of the following authors are suggested: Botsford, Morey or Myers, in ancient history (to 814 A.D.); Adams, West or Myers, in medieval history; Montgomery, Larned or Cheyney, in English history; Myers or Fisher, in general history; Fiske, together with MacLaughlin or Montgomery, in United States history and civics.

ENGLISH. — The study of English in school has two main objects, which should be considered of equal importance: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence and appreciation, and the development of the habit of reading good literature with enjoyment.

(1) *Grammar and Composition* (One and One-half Units). — The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, sentences and paragraphs should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise letter-writing, narration, description and easy exposition and argument. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by concerted effort of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

(2) *Literature* (One and One-half Units). — The second object is sought by means of two lists of books, headed, respectively, "Reading" and "Study," from which may be framed a progressive course in literature covering four years. In connection with both lists the student should be trained in reading aloud and encouraged to commit to memory some of the more notable passages both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads and with their place in literary history.

A. *Books for Reading*. — The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

The books provided for reading are arranged in the following groups, from each of which at least two selections are to be made, except that for any book in Group I. a book from any other may be substituted.

#### GROUP I. CLASSICS IN TRANSLATION.

The "Old Testament," at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings and Daniel, together with the books of Ruth and Esther.  
 The "Odyssey," with the omission, if desired, of Books I-V, XV and XVI.  
 The "Æneid."  
 The "Odyssey" and the "Æneid" should be read in English translations of recognized literary excellence.

#### GROUP II. DRAMA.

Shakespeare: "Merchant of Venice," "As You Like It," "Julius Cæsar."

#### GROUP III. PROSE FICTION.

Dickens: "A Tale of Two Cities."  
 George Eliot: "Silas Marner."  
 Scott: "Quentin Durward."  
 Hawthorne: "The House of the Seven Gables."

#### GROUP IV. ESSAYS, BIOGRAPHY, ETC.

Addison and Steele: "The Sir Roger de Coverly Papers."  
 Irving: "The Sketch Book," selections covering about 175 pages.  
 Macaulay: "Lord Clive."  
 Parkman: "The Oregon Trail."

#### GROUP V. POETRY.

Tennyson: "The Coming of Arthur," "Gareth and Lynette," "Lancelot and Elaine," "The Passing of Arthur."  
 Browning: "Cavalier Tunes," "The Lost Leader," "How They Brought the Good News from Ghent to Aix," "Home Thoughts from Abroad," "Home Thoughts from the Sea," "Incident of the French Camp," "Herve Riel," "Pheidippides," "My Last Duchess," "Up at a Villa—Down in the City," "The Italian in England," "The Patriot," "The Pied Piper," "De Gustibus," "Instans Tyrannus."  
 Scott: "The Lady of the Lake."  
 Coleridge: "The Ancient Mariner."  
 Arnold: "Sohrab and Rustum."

*B. Books for Study.*—This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. The books provided for study are arranged in four groups, from each of which one selection is to be made.

The books provided for study are arranged in four groups, from each of which one selection is to be made.

#### GROUP I. DRAMA.

Shakespeare: "Macbeth," "Hamlet."

#### GROUP II. POETRY.

Milton: "L'Allegro," "Il Penseroso," "Comus."  
 Book IV of Palgrave's "Golden Treasury" (first series), with special attention to Wordsworth, Keats and Shelley.

## GROUP III. ORATORY.

Burke: "Speech on Conciliation with America."

Washington's "Farewell Address," Webster's "First Bunker Hill Oration," and Lincoln's "Gettysburg Address."

## GROUP IV. ESSAYS.

Macaulay: "Life of Johnson."

Carlyle: "Essay on Burns," with a brief selection from Burns' poems.

*Examination.* — However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling or other essentials of good usage.

The examination will be divided into two parts, one of which will be on grammar and composition, and the other on literature.

In grammar and composition, the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English which one should know in distinction from current errors. The main test in composition will consist of one or more essays, developing a theme through several paragraphs; the subjects will be drawn from the books read, from the candidate's other studies and from his personal knowledge and experience quite apart from reading.

The examination in literature will include: —

(a) General questions designed to test such a knowledge and appreciation of literature as may be gained by fulfilling the requirements defined under "A, Reading," above.

(b) A test on the books prescribed for study, which will consist of questions upon their content and structure, and upon the meaning of such words, phrases and allusions as may be necessary to an understanding of the works and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their works and the periods of literary history to which they belong.

**FRENCH.** — Elementary: The necessary preparation for this examination is stated in the description of the two-year course in elementary French recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year French (elective subjects for admission). — For a third credit unit in French as an elective subject for entrance, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in French will be given unless the candidate has presented elementary French on certificate, or has written the examination in elementary French.

No examination for a fourth credit in French will be given unless the candidate has presented both elementary and intermediate French upon certificate, or has written the examination in both elementary and intermediate French.

**GERMAN.** — Elementary: The entrance requirements in German conform to those of the College Entrance Examination Board for elementary German (the standard two-year requirements).

Third and fourth year German (elective subjects for admission). — For a third credit unit in German as an elective subject for entrance, when required units have been offered in German, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in German will be given unless the candidate has presented elementary German upon certificate, or has written the examination in elementary German.

No examination for a fourth credit in German will be given unless the candidate has presented both elementary and intermediate German upon certificate, or has written the examination for both elementary and intermediate German.

**SPANISH.** — *Elementary:* The necessary preparation for this examination is stated in the description of the two-year course in elementary Spanish recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year Spanish (elective subjects for admission). — For a third credit unit in Spanish as an elective subject for entrance, the work heretofore described by the College Entrance Examination Board as "intermediate" is expected. For a fourth credit unit, the work described as "advanced" is expected.

No examination for a third unit in Spanish will be given unless the candidate has presented elementary Spanish on certificate, or has written the examination in elementary Spanish.

No examination for a fourth credit in Spanish will be given unless the candidate has presented both elementary and intermediate Spanish upon certificate, or has written the examination in both elementary and intermediate Spanish.

**GREEK.** — *Elementary.* — Greek grammar and composition: Translation into Greek of short sentences illustrating common principles of syntax.

The examination in grammar and prose composition will be based on the first four books of Xenophon's "Anabasis."

*Intermediate.* — Homer's "Iliad," Books I and II (omitting Book II, 494 to end), and the Homeric forms, constructions, idioms and prosody.

Prose composition, consisting of continuous prose based on Xenophon, and other Attic prose of similar difficulty.

Translation of passages of Homer at sight.

**The examinations in Greek, elementary and intermediate, will be given in September only.**

**LATIN.** — *Elementary.* — Two credit units will be allowed if satisfactory proficiency is shown (including grammar) in (a) the translation of a passage or passages taken from Cæsar's "Gallic War," covering at least four books, and (b) the translation of passages of Latin prose at sight.

*Intermediate.* — Cicero (third oration "Against Catiline" and the orations "For Archias" and "For Marcellus") and sight translation of prose.

*Advanced.* — Vergil (Æneid, II, III and VI) and sight translation of poetry.

#### E. ADMISSION TO ADVANCED STANDING.

Candidates for admission to advanced standing, in addition to meeting the regular entrance requirements, must also pass examinations in those subjects already pursued by the class they desire to enter. To meet this require-



ment, a student transferring to this college from another college or university of recognized standing must present the following credentials:—

1. A letter of honorable dismissal from the institution with which he has been connected.

2. A statement or certificate of his entrance record.

3. A statement from the proper officer showing a complete record of his work while in attendance.

4. A marked catalogue showing the courses pursued.

5. A statement from the proper officer, giving the total number of credits required for graduation by the institution from which the applicant is transferring, and, of this total, the number that the applicant has satisfactorily completed at the time of transfer.

These credentials should be presented to the registrar. Applications will be judged wholly on their merits and the college may prescribe additional tests before accepting applicants or determining the standing to be granted them.

#### F. OTHER INFORMATION ABOUT ENTRANCE.

1. The privileges of the college may be withdrawn from any student at any time if such action is deemed advisable. (It is immaterial whether the pupil has entered by certificate or by examination.)

2. The examination in each subject may be either oral or written, or both. The standard required for passing an entrance examination is 65 per cent.

3. To matriculate, candidates must offer twelve and one-half of the fourteen and one-half units required for admission, and will be conditioned in those subjects not passed. At least five and one-half credits must be in the prescribed group. No candidate deficient in both algebra and plane geometry will be admitted.

4. Examinations for the removal of entrance conditions will be held as follows: (1) First entrance condition examination during the first week of the second term. (2) Second entrance condition examination before the beginning of the period of final examinations of the second term, upon the payment of a fee of \$5 to the treasurer.

5. Credits for entrance requirements, whether gained by certificate or by examination, will hold good for one year.

6. Examinations in part of the subjects required for entrance may be taken one year before entering college.

7. For information concerning expenses, scholarships, etc., see "General Information."

8. For information concerning admission to short courses, see "Short Courses."

9. Application for admission as a "Special Student" should be made to the Dean.

## COURSES OF INSTRUCTION.

## TABLE OF FRESHMAN AND SOPHOMORE SUBJECTS.

[The figures indicate the number of credit hours a week. For details, see the descriptions of courses.]

## FRESHMAN YEAR.

## FIRST TERM.

*All work required.*

SUBJECT.	Courses and Numbers.	Credit Hours per Week.
Chemistry, . . . . .	Chemistry 1 or 4, . . . . .	3
Algebra, . . . . .	Mathematics 1, . . . . .	5
Language, . . . . .	French or German 1 or 4, . . . . .	3
English, . . . . .	English 1, . . . . .	3
Agriculture, . . . . .	Agronomy 1, Horticulture 1, . . . . .	3
Tactics (for men), . . . . .	Military 1, . . . . .	1
Drill (for men), . . . . .	Military 4, . . . . .	1
Microbiology (for women), . . . . .	Microbiology 1, . . . . .	3
Hygiene, . . . . .	Physical Education 1, . . . . .	1
Public speaking, . . . . .	Public Speaking 1 (one-third of the class), . . . . .	1

College life (attendance without credit).

## SECOND TERM.

Chemistry, . . . . .	Chemistry 2 or 5, . . . . .	3
Algebra, . . . . .	Mathematics 2, . . . . .	2
Trigonometry, . . . . .	Mathematics 5, . . . . .	3
Language, . . . . .	French or German 2 or 5, . . . . .	3
English, . . . . .	English 2, . . . . .	3
Agriculture, . . . . .	Poultry 1, Animal Husbandry 1, . . . . .	3
Tactics (for men), . . . . .	Military 2, . . . . .	1
Drill (for men), . . . . .	Military 5, . . . . .	1
Geology (for men), . . . . .	Geology 2, . . . . .	2
Rural home life (for women), . . . . .	Rural Home Life 2, . . . . .	2
Public speaking, . . . . .	Public Speaking 1 (one-third of class), . . . . .	1

College life (attendance without credit).

FRESHMAN YEAR — *Concluded.*

## THIRD TERM.

SUBJECT.	Courses and Numbers.	Credit Hours per Week.
Chemistry, . . . .	Chemistry 3 or 6, . . . . .	3
Solid geometry, . . . .	Mathematics 3, . . . . .	3
Mensuration (for men), . .	Mathematics 6, . . . . .	2
Language, . . . . .	French or German 3 or 6, . . . . .	3
English, . . . . .	English 3, . . . . .	3
Botany, . . . . .	Botany 3, . . . . .	3
Tactics (for men), . . . .	Military 3, . . . . .	1
Drill (for men), . . . . .	Military 6, . . . . .	1
Microbiology (for women), .	Microbiology 3, . . . . .	2
Rural home life (for women), .	Rural Home Life 3, . . . . .	3
Recreation, . . . . .	Physical Education 3, . . . . .	1
Public speaking, . . . .	Public Speaking 1 (one-third of class), . . . .	1

College life (attendance without credit).

## SOPHOMORE YEAR.

## FIRST TERM.

SUBJECT.	Course Number.	Class Hours.	Two Hour Laboratory Periods.	Credit Hours per Week.
<i>Required.</i>				
Physics, . . . . .	25	3	1	4
Zoölogy, . . . . .	25	2	2	4
Botany, . . . . .	25	1	2	3
English, . . . . .	25	2	-	2
Military (for men), . . . . .	25	1	-	1
Military (for men), . . . . .	28	-	2	1
Microbiology (for women), . . . . .	25	2	-	2
Total required, . . . . .	-	-	-	17
<i>Elective.</i>				
Chemistry, . . . . .	25	1	2	3
French, . . . . .	25 or 28	3	-	3
German, . . . . .	25 or 28	3	-	3
Drawing, . . . . .	25	-	3	3
Animal husbandry, . . . . .	25	2	1	3
Rural engineering, . . . . .	25	-	2	2
Rural home life, . . . . .	25	1	2	3

Minimum credit for first term, 18.

Maximum credit for first term, 21.

## SECOND TERM.

<i>Required.</i>				
Physics, . . . . .	26	2	1	3
Agricultural economics, . . . . .	26	5	-	5
English, . . . . .	26	2	-	2
Military (for men), . . . . .	26	1	-	1
Military (for men), . . . . .	29	-	2	1
Total required, . . . . .	-	-	-	12
<i>Elective.</i>				
Chemistry, . . . . .	26	1	2	3
French, . . . . .	26 or 29	3	-	3
German, . . . . .	26 or 29	3	-	3
Mathematics, . . . . .	26	2	-	2
Drawing, . . . . .	26	-	3	3
Entomology, . . . . .	26	3	-	3
Animal husbandry, . . . . .	26	2	1	3
Rural engineering, . . . . .	26	-	2	2
Botany, . . . . .	26	1	2	3
Economic sociology, . . . . .	26	5	-	5
Rural home life (for women), . . . . .	26	1	2	3

Minimum credit for second term, 18.

Maximum credit for second term, 20.

SOPHOMORE YEAR — *Concluded.*

## THIRD TERM.

SUBJECT.	Course Number.	Class Hours.	Two-Hour Laboratory Periods.	Credit Hours per Week.
<i>Required.</i>				
Rural sociology, . . . . .	27	3	—	3
Agronomy, . . . . .	27	4	1	5
English, . . . . .	27	2	—	2
Military (for men), . . . . .	27	1	—	1
Military (for men), . . . . .	30	—	2	1
Microbiology (for women), . . . . .	27	2	—	2
Physical education, <sup>1</sup> . . . . .	26	—	1	1
Total required, . . . . .	—	—	—	15
<i>Elective.</i>				
Botany, . . . . .	27	1	2	3
Chemistry, . . . . .	27	1	4	5
Chemistry, . . . . .	30	3	2	5
French, . . . . .	27 or 30	3	—	3
German, . . . . .	27 or 30	3	—	3
Mathematics, . . . . .	27	—	3	3
Drawing, . . . . .	27	—	3	3
Entomology, . . . . .	27	—	2	2
Geology, . . . . .	27	3	2	5
Physics, . . . . .	27	4	1	5
Horticulture, . . . . .	27	2	1	3
Zoology, . . . . .	27	1	2	3
Rural home life (for women), . . . . .	27	1	2	3

Minimum credit for third term, 19.

Maximum credit for third term, 22.

<sup>1</sup> Credit for Physical Education 2 and 3 given in third term.

## MAJORS: JUNIOR AND SENIOR YEARS.

## GENERAL STATEMENT.

A major consists of 45 credit hours of correlated work, to be arranged by the student and an instructor called the adviser.

The list of courses found under each major on subsequent pages should not be considered as necessarily a rigid program to be followed. The heads of departments have suggested this series of courses as the best for the average man majoring in their departments. Advisers may, however, make modifications to suit the particular needs of the student, provided these modifications conform precisely to the class schedule as published for the year.

## RULES GOVERNING MAJORS.

RULE 1. *Election.* — Each student, before the first term of his junior year, shall elect a major subject from the list of majors given below; and this major shall consist of 45 credit hours of correlated work.

RULE 2. *Minimum Credits.* — The minimum number of credits for graduation shall be 237 credit hours, inclusive of military drill and physical education.

RULE 3. *Maximum Credits.* — The maximum number of credits for any term of the junior or senior year shall be 22; the minimum shall be 19.

RULE 4. *Humanities and Rural Social Science.* — A minimum of 18 credit hours in the Divisions of the Humanities and Rural Social Science will be required of all students during their junior and senior years, with the following restriction: that a minimum of 5 credit hours will be required in each of the divisions.

RULE 5. *Advisers.* — The work of each junior and senior will be under the immediate supervision of an instructor designated as major adviser. Ordinarily, the major adviser will be the head of the department in which the student intends to elect his major. Each student should consult with the adviser as soon as possible. The adviser has full authority to prescribe the student's work up to 45 hours. It is understood, however, that so far as practicable the individual needs of the student will be recognized. It is also hoped and expected that students will be disposed to seek the counsel of the adviser with respect to the remaining courses required for graduation.

RULE 6. *Free Electives.* — Each student during his junior and senior years is required to take 45 hours in his major and also 18 hours in the Divisions of the Humanities and Rural Social Science, making a total of 63 hours (but see Rule 4). He is allowed free choice of courses to complete his required hours.

RULE 7. *Registration.* — No junior or senior shall register until his major course of study is approved by his adviser.

(1) Course cards for recording the election of majors will be issued from the registrar's office three weeks before the close of each term.

(2) This card must be submitted by each student to his major adviser, who will lay out the course for the succeeding term and countersign the card.

(3) Each course card must be filled out, giving the name of student, his college address, the name of parent or guardian, and the student's home address. When the major courses have been entered on this card, and the hours

of free elections added by the student, the card must be returned to the registrar one week before the beginning of the final examination period.

RULE 8. *Changes.* — Applications for changes may be made to the dean in writing at any time; when approved by him and by the committee on scholarship, they become operative at the beginning of the term following, provided that no change in the selection of a major may be made by any student after registration day of his senior year.

## AGRICULTURE. (Major.)

Professor JAMES A. FOORD, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Agromony, . . . . .	50 I.	5	<b>I.</b>	Animal Husbandry 25,	3	Agromony 50,	5	Rural Engineering 75,	5
Animal Husbandry, . . . . .	53 III.	3		Rural Engineering 25,	2	Dairying 50 (or 77),	5	Farm Management 75,	3
						Animal Husbandry 50,	3	Farm Management 76,	3
Animal Husbandry, . . . . .	50 I.	3	<b>II.</b>	Animal Husbandry 26,	3	Animal Husbandry 51,	3	Farm Management 78,	1
Animal Husbandry, . . . . .	51 II.	3		Rural Engineering 26,	2				
Dairying, . . . . .	50 I.	5							
Farm Management, . . . . .	75 I.	3	<b>III.</b>	Chemistry 30,	5	Microbiology 50,	5	Farm Management 77,	3
Farm Management, . . . . .	76 I.	3		Horticulture 27,	3	Animal Husbandry 53,	3	Farm Management 78,	1
Farm Management, . . . . .	77 III.	3						Rural Engineering 78,	3
Farm Management, . . . . .	78 II.	1						Rural Engineering 79,	5
Farm Management, . . . . .	79 III.	1							
Microbiology, . . . . .	50 I.								
or									
Microbiology, . . . . .	50 III.	5	<b>IV.</b>						
Rural Engineering, . . . . .	75 I.	5							
Rural Engineering, . . . . .	78 III.	3							
Rural Engineering, . . . . .	79 III.	5							
		48							

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — Animal Husbandry 25 and 26, Rural Engineering (shop work) 25 and 26, Chemistry 30 or Chemistry 6, Freshman, and Horticulture 27.

ADDITIONAL INFORMATION. — Botany 26, Drawing 26, Entomology 26 and 27, Dairying 75, Pomology 50, 51, 52 and 78, and Veterinary 51, 75 and 78 are suggested as additional courses for the student fitting himself for general agriculture.



## AGRONOMY. (Major.)

Professor ARTHUR B. BEAUMONT, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

Course.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Agronomy, . . . . .	50 I.	5	I.	Chemistry 25, . . . . .	. . . . . 3	Agronomy 50, . . . . .	. . . . . 5	Agronomy 75, . . . . .	. . . . . 5
Agronomy, . . . . .	51 III.	3		German 25 or 28, . . . . .	. . . . . 3	Chemistry 51, . . . . .	. . . . . 8	Farm Management 76, . . . . .	. . . . . 3
Agronomy, . . . . .	75 I.	5				Animal Husbandry 50, . . . . .	. . . . . 3		
Agronomy, . . . . .	77 II.	5	II.	Botany 26, . . . . .	. . . . . 3	Chemistry 52, . . . . .	. . . . . 8	Agronomy 77, . . . . .	. . . . . 5
Animal Husbandry, . . . . .	50 I.	3		Chemistry 26, . . . . .	. . . . . 3				
Chemistry, . . . . .	51 I.	8		German 26 or 29, . . . . .	. . . . . 3				
				Mathematics 26, . . . . .	. . . . . 2				
Chemistry, . . . . .	52 II.	8	III.	German 27 or 30, . . . . .	. . . . . 3	Agronomy 51, . . . . .	. . . . . 3	Farm Management 77, . . . . .	. . . . . 3
Farm Management, . . . . .	76 I.	3		Mathematics 27, . . . . .	. . . . . 3				
Farm Management, . . . . .	77 III.	3		Geology 27, . . . . .	. . . . . 5				
		43	IV.						

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — Chemistry 25 and 26, German 25 or 28, 26 or 29, 27 or 30, Geology 27, Botany 26.  
 ADVISED. — Mathematics 26 and 27.

## ANIMAL HUSBANDRY. (Major.)

Professor S. M. SALISBURY, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

Course.	Number.		Term.	Sophomore.		Junior.	Credit.		Senior.	Credit.
		Credit.								
Agromony, . . . . .	50 I.	5	I.	Animal Husbandry 25,	. 3	Animal Husbandry 50,	. 3		Animal Husbandry 75,	. 3
Animal Husbandry, . . . . .	51 II.	3				Agromony 50,	. . 5		Farm Management 75,	. 3
Animal Husbandry, . . . . .	50 I.	3				Veterinary 50,	. . 5		Farm Management 76,	. 3
						Dairying 50,	. . 5			
Animal Husbandry, . . . . .	52 III.	3	II.	Animal Husbandry 26,	. 3	Animal Husbandry 51,	. 3		Animal Husbandry 78,	. 3
Animal Husbandry, . . . . .	75 I.	3								
Animal Husbandry, . . . . .	53 III.	3	III.	Chemistry 30,	. . 5	Animal Husbandry 52,	. 3		Animal Husbandry 80,	. 1
Animal Husbandry, . . . . .	78 II.	3				Animal Husbandry 53,	. 3			
Animal Husbandry, . . . . .	80 III.	1								
Dairying, . . . . .	50 I.	5	IV.							
Farm Management, . . . . .	75 I.	3								
Farm Management, . . . . .	76 I.	3								
Veterinary, . . . . .	50 I.	5								
		40								

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — Animal Husbandry 25 and 26, Chemistry 30.  
 ADDITIONAL INFORMATION. — The balance of the sophomore electives allowed are left to the student to choose.

## DAIRYING. (Major.)

Professor WILLIAM P. B. LOCKWOOD, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

Course.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Animal Husbandry, . . . .	52 III.	3	I.	Animal Husbandry 25, . . 3	. 3	Dairying 50, . . . . 5	. 5	Microbiology 82, . . . 5	. 3
Animal Husbandry, . . . .	50 I.	3		Rural Engineering 25, . . 2		Microbiology 50, . . . 5		Farm Management 75, . . 3	
Animal Husbandry, . . . .	51 II.	3				Animal Husbandry 50, . . 3			
Dairying, . . . .	50 I.	5	II.	Animal Husbandry 26, . . 3	. 3	Animal Husbandry 51, . . 3	. 3	Dairying 75, . . . . 5	. 5
Dairying, . . . .	51 III.	5		Rural Engineering 26, . . 2		Rural Engineering 77, . . 5			
Dairying, . . . .	75 II.	5				Microbiology 51, . . . 5			
						(Prerequisite to 82.)			
Dairying, . . . .	76 III.	5	III.	Chemistry 30, . . . . 5	. 5	Animal Husbandry 52, . . 3	. 3	Dairying 76, . . . . 5	. 5
Farm Management, . . . .	75 I.	3				Dairying 51, . . . . 5			
Microbiology, . . . .	50 I.	5							
Microbiology, . . . .	82 I.	5							
Microbiology, . . . .	51 II.	5							
Rural Engineering, . . . .	77 II.	5	IV.						
		52							

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — Animal Husbandry 25 and 26, Rural Engineering 25 and 26, Chemistry 30.  
 ADDITIONAL INFORMATION. — The balance of the sophomore electives allowed are left to the student to choose.

## POULTRY HUSBANDRY. (Major.)

Professor JOHN C. GRAHAM, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

Course.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Animal Husbandry, . . . .	53 III.	3	I.			Poultry 50, . . . .	3	Poultry 76, . . . .	5
Poultry Husbandry, . . . .	50 I.	3				Poultry 51, . . . .	2	Poultry 77, . . . .	5
						Pomology 50, . . . .	3		
Poultry Husbandry, . . . .	51 I.	2	II.			Poultry 52, . . . .	3	Poultry 75, . . . .	5
Poultry Husbandry, . . . .	52 II.	3						Veterinary 86, . . . .	3
Poultry Husbandry, . . . .	53 III.	5						Poultry 55, . . . .	1-5
Poultry Husbandry, . . . .	55	1-5							
Poultry Husbandry, . . . .	54 III.	2	III.			Poultry 53, . . . .	5		
Poultry Husbandry, . . . .	75 II.	5				Poultry 54, . . . .	2		
Poultry Husbandry, . . . .	76 I.	5				Animal Husbandry 53, . . . .	3		
Agricultural Economics, . . . .	53 III.	5				Agricultural Economics 53, . . . .	5		
Poultry Husbandry, . . . .	77 I.	5	IV.						
Pomology, . . . .	50 I.	3							
Veterinary Science, . . . .	86 II.	3							
		45-49							

SOPHOMORE RECOMMENDATIONS. — Students intending to major in Poultry Husbandry are urged to take Zoölogy 27. ADVISED. — Juniors who did not take Zoölogy 27 as sophomores are strongly advised to include it in their program.

## FLORICULTURE.

Professor CLARK L. THAYER, *Adviser*.

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Botany, . . . . .	50 I.	2	I.	Drawing 25, . . . . .	. . . . . 3	Floriculture 50, . . . . .	. . . . . 4	Floriculture 75, . . . . .	. . . . . 3
Botany, . . . . .	51 II.	2				Floriculture 53, . . . . .	. . . . . 3	Horticulture 50, . . . . .	. . . . . 5
Entomology, . . . . .	20 II.	3				Botany 50, . . . . .	. . . . . 2		
Floriculture, . . . . .	50 I.	4	II.	Drawing 26, . . . . .	. . . . . 3	Floriculture 51, . . . . .	. . . . . 4	Floriculture 77, . . . . .	. . . . . 3
Floriculture, . . . . .	51 II.	4		Entomology 26, . . . . .	. . . . . 3	Floriculture 54, . . . . .	. . . . . 3	Floriculture 76, . . . . .	. . . . . 3
Floriculture, . . . . .	52 III.	4		Botany 26, . . . . .	. . . . . 3	Entomology 25, . . . . .	. . . . . 3		
						Botany 51, . . . . .	. . . . . 2		
Floriculture, . . . . .	53 I.	3	III.	Drawing 27, . . . . .	. . . . . 3	Floriculture 52, . . . . .	. . . . . 4	Floriculture 79, . . . . .	. . . . . 3
Floriculture, . . . . .	54 II.	3		Entomology 27, . . . . .	. . . . . 2	Floriculture 78, . . . . .	. . . . . 3	Floriculture 80, . . . . .	. . . . . 3
Floriculture, . . . . .	75 I.	3		Horticulture 27, . . . . .	. . . . . 3			Horticulture 51, . . . . .	. . . . . 5
Floriculture, . . . . .	76 II.	3							
Floriculture, . . . . .	77 II.	3	IV.						
Floriculture, . . . . .	78 III.	3							
Floriculture, . . . . .	79 III.	3							
Floriculture, . . . . .	80 III.	3							
Horticulture, . . . . .	50 I.	5							
Horticulture, . . . . .	51 III.	5							
		53							

SOPHOMORE ELECTIVE PREREQUISITES. — Drawing 25, 26 and 27, Entomology 26 and 27, Botany 26 and Horticulture 27.

ADDITIONAL INFORMATION. — The rest of the sophomore electives allowed are left to the student to choose. Horticulture 50 and 51 will be taken by seniors.

ADVISED. — The department advises all students who major in this subject to take Botany 78, Entomology 50 and Landscape Gardening 75.

## FORESTRY. (Major.)

Professor LAWRENCE R. GROSE, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

Course.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Botany, . . . . .	50 I.	2	I.	Drawing 25, . . . . .	3	Forestry 50, . . . . .	3	Forestry 75, . . . . .	5
Botany, . . . . .	51 II.	2		Rural Engineering 25, . . . . .	2	Landscape Gardening 50, . . . . .	5		
Entomology, . . . . .	75 III.	4				Horticulture 50, . . . . .	5		
Forestry, . . . . .	50 I.	3	II.	Drawing 26, . . . . .	3	Botany 50, . . . . .	2		
Forestry, . . . . .	51 II.	3		Mathematics 26, . . . . .	2	Forestry 51, . . . . .	3		
Forestry, . . . . .	53 III.	3		Entomology 26, . . . . .	3	Botany 51, . . . . .	2		
Forestry, . . . . .	54 IV.	5		Botany 26, . . . . .	3	Landscape Gardening 51, . . . . .	4		
Forestry, . . . . .	75 I.	5	III.	Drawing 27, . . . . .	3	Forestry 53, . . . . .	3		
Forestry, . . . . .	78 III.	3		Mathematics 27, . . . . .	2	Horticulture 51, . . . . .	5		
Horticulture, . . . . .	50 I.	5		Entomology 27, . . . . .	3	Entomology 75, . . . . .	4		
Horticulture, . . . . .				Horticulture 27, . . . . .	3			Forestry 78, . . . . .	3
Horticulture, . . . . .	51 III.	5	IV.			Forestry 54, . . . . .	5		
Landscape Gardening, . . . . .	50 I.	5							
Landscape Gardening, . . . . .	51 II.	4							
		49							

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — Drawing 25, 26 and 27, Rural Engineering 25, Mathematics 26 and 27, Entomology 26 and 27, Botany 26, Horticulture 27.

ADDITIONAL INFORMATION. — Substitutions according to individual needs may be made in conference with the adviser.

LANDSCAPE GARDENING. (Major.)  
 PROFESSOR FRANK A. WAUGH, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Floriculture, . . . .	78 III.	3	I.	Drawing 25, . . . .	3	Landscape Gardening 50, . .	5	Landscape Gardening 75, . .	3
Horticulture, . . . .	50 I.	5				Horticulture 50, . . . .	5	Landscape Gardening 80, . .	4
Horticulture, . . . .	51 III.	5							
Landscape Gardening,	50 I.	5							
Landscape Gardening,	51 II.	4	II.	Drawing 26, . . . .	3	Landscape Gardening 51, . .	4	Landscape Gardening 76, . .	4
Landscape Gardening,	52 III.	5		Mathematics 26, . . . .	2			Landscape Gardening 81, . .	4
				Entomology 26, . . . .	3				
Landscape Gardening,	75 I.	3	III.	Drawing 27, . . . .	3	Landscape Gardening 52, . .	5	Landscape Gardening 78	3
Landscape Gardening,	76 II.	4		Mathematics 27, . . . .	3	Horticulture 51, . . . .	5	or 79, . . . .	3
Landscape Gardening,	77 III.	4		Horticulture 27, . . . .	3	Landscape Gardening 77, . .	4	Landscape Gardening 77, . .	4
						or 79, . . . .	3	Landscape Gardening 82, . .	4
								Floriculture 78, . . . .	3
Landscape Gardening,	78 III.	3	IV.						
or									
Landscape Gardening,	79 III.	3							
Landscape Gardening,	80 I.	4							
Landscape Gardening,	81 II.	4							
Landscape Gardening,	82 III.	4							
		56							

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — Drawing 25, 26 and 27, Mathematics 25 and 27, Horticulture 27.  
 ADDITIONAL INFORMATION. — Modifications may be permitted when they appear advisable.

## POMOLOGY. (Major.)

Professor FRED C. SEARS, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Agronomy, . . . . .	75 I.	5	I.			Pomology 50, . . . . .	3	Pomology 75, . . . . .	3
Horticultural Manufactures, . . . . .	75 I.	5				Agronomy 75, . . . . .	5	Pomology 77, . . . . .	5
Vegetable Gardening, . . . . .	50 I.	3				Farm Management 75, . . . . .	3	Pomology 80, . . . . .	1
						Vegetable Gardening 50, . . . . .	3	Horticultural Manuf. 75, . . . . .	5
Pomology, . . . . .	50 I.	3	II.			Pomology 51, . . . . .	3	Pomology 76, . . . . .	3
Farm Management, . . . . .	75 I.	3				Rural Engineering 77, . . . . .	5	Pomology 81, . . . . .	1
Horticultural Manufactures, . . . . .	76 II.	3						Horticultural Manuf. 76, . . . . .	3
Pomology, . . . . .	51 II.	3	III.			Pomology 52, . . . . .	3	Pomology 78, . . . . .	3
Pomology, . . . . .	52 III.	3				Agricultural Economics 53, . . . . .	5	Pomology 82, . . . . .	1
Pomology, . . . . .	75 I.	3							
Agricultural Economics, . . . . .	53 III.	5							
Rural Engineering, . . . . .	77 II.	5		Horticulture 27, . . . . .	3				
Pomology, . . . . .	76 II.		IV.						
Pomology, . . . . .	77 I.								
Pomology, . . . . .	78 III.								
Pomology, . . . . .	80 I.								
Pomology, . . . . .	81 II.								
Pomology, . . . . .	82 III.								
		41							

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — Horticulture 27.

ADVISED. — Rural Engineering 26, Entomology 23 and 27.

ADDITIONAL INFORMATION. — The rest of the sophomore electives allowed are left to the student to choose.



## VEGETABLE GARDENING. (Major.)

Associate Professor A. L. DACY, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Agromony, . . . . .	75 I.	5	I.			Vegetable Gardening 51, . . . 3		Vegetable Gardening 75, . . . 5	
Agromony, . . . . .	77 II.	5				Botany 50, . . . . . 2		Agromony 75, . . . . . 5	
Botany, . . . . .	50 I.	2						Vegetable Gardening 78, . . . 1	
Botany, . . . . .	51 II.	2							
Vegetable Gardening, . . . . .	51 I.	3	II.	Botany 26, . . . . .	3	Vegetable Gardening 52, . . . 3		Vegetable Gardening 76, . . . 5	
Vegetable Gardening, . . . . .	52 II.	3				Botany 51, . . . . . 2		Vegetable Gardening 79, . . . 1	
Vegetable Gardening, . . . . .	53 III.	3						Agromony 77, . . . . . 5	
Vegetable Gardening, . . . . .	54 IV.	5	III.	Horticulture 27, . . . . .	3	Vegetable Gardening 53, . . . 3		Vegetable Gardening 77, . . . 5	
Vegetable Gardening, . . . . .	75 I.	5						Vegetable Gardening 80, . . . 1	
Vegetable Gardening, . . . . .	76 II.	5	IV.			Vegetable Gardening 54, . . . 5			
Vegetable Gardening, . . . . .	77 III.	5							
Vegetable Gardening, . . . . .	78	1							
Vegetable Gardening, . . . . .	79	1							
Vegetable Gardening, . . . . .	80	1							
		46							

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — Botany 26, Horticulture 27.

ADVISED. — Rural Engineering 26, Entomology 26 and 27.

ADDITIONAL INFORMATION. — The rest of the sophomore electives allowed are left to the student to choose.

## ECONOMIC BOTANY. (Major.)

Professor A. VINCENT OSMUN, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.		Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Botany,	.	52 I.	3	<b>I.</b>	Chemistry 25,	.	Botany 52,	.	Botany 75,	.
Botany,	.	53 II.	3		German 25 or 28,	.	Botany 55,	.	Botany 76,	.
Botany,	.	54 III.	3				Chemistry 51,	.	Botany 78,	.
Botany,	.	55 I.	3					.	Botany 80,	.
Botany,	.	56 II.	3							1
Botany,	.	75 I.	5	<b>II.</b>	Chemistry 26,	.	Botany 53,	.	Botany 76,	.
Botany,	.	76 II.	5		German 26 or 29,	.	Botany 56,	.	Botany 79,	.
Botany,	.	77 III.	5		Botany 26,	.		.	Botany 82,	.
Botany,	.	78 I.	5					.	Botany 87,	.
Botany,	.	79 II.	5					.		1
Botany,	.	80 III.	5							
Botany,	.	82 II.	3	<b>III.</b>	German 27 or 30,	.	Botany 54,	.	Botany 77,	.
Botany,	.	83 III.	3		Botany 27, <sup>1</sup>	.		.	Botany 80,	.
Botany,	.	86 I.	1					.	Botany 83,	.
Botany,	.	87 II.	1					.	Botany 88,	.
Botany,	.	88 III.	1					.		1
Chemistry,	.	51 I.	8							
			62	<b>IV.</b>						

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — German 25 or 28, 26 or 29, 27 or 30, Botany 25. ADVISED. — Chemistry 25 and 26.

ADDITIONAL INFORMATION. — The balance of the sophomore electives allowed are left to the student to choose. Selection of 45 credits of the above (Pathology 75, 76 and 77, Physiology 78, 79 and 80).

<sup>1</sup> May be taken in junior or senior year.

## AGRICULTURAL CHEMISTRY. (Major.)

Professor CHARLES A. PETERS, *Adviser*.

[The heavy-faced type indicates the term in which the course is given.]

Course.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Chemistry, . . . . .	51 I.	8	I.	Chemistry 25, . . . . .	. . . . . 3	Chemistry 51, . . . . .	. . . . . 8	Chemistry 76, . . . . . Chemistry 80, . . . . .	. . . . . 5 . . . . . 5
Chemistry, . . . . .	52 II.	8							
Chemistry, . . . . .	62 III.	5							
Chemistry, . . . . .	65 III.	5	II.	Chemistry 26, . . . . .	. . . . . 3	Chemistry 52, . . . . .	. . . . . 8	Chemistry 77, . . . . . Chemistry 90, 92, 94, . . . . .	. . . . . 3 . . . . . 3
Chemistry, . . . . .	76 I.	5							
Chemistry, . . . . .	77 II.	5							
Chemistry, . . . . .	80 I.	5							
Chemistry, . . . . .	87 III.	3							
Chemistry, . . . . .	90 II.	3 <sup>1</sup>							
Chemistry, . . . . .	92 II.								
Chemistry, . . . . .	94 II.	5	III.	Chemistry 27, . . . . .	. . . . . 5	Chemistry 62, . . . . . Chemistry 65, . . . . .	. . . . . 5 . . . . . 5	Chemistry 91, 93, 95, . . . . . Chemistry 87, . . . . .	. . . . . 5 . . . . . 3
Chemistry, . . . . .	91 III.								
Chemistry, . . . . .	93 II.								
Chemistry, . . . . .	95 III.								
		50 <sup>2</sup>	IV.						

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — Chemistry 25, 26 and 27.

ADVISED. — German 25 or 28, 26 or 29, 27 or 30, Physics 27.

ADDITIONAL INFORMATION. — The balance of the sophomore electives allowed are left for the student to choose.

<sup>1</sup> Courses 90, 92, 94 may be changed from 3 credits to an option of 3 or 5 credits. Students will select one course from groups 90, 92, 94, and 91, 93, 95 respectively.<sup>2</sup> Only 45 credits required.

ECONOMIC ENTOMOLOGY. (Major.)  
 PROFESSOR HENRY T. FERNALD, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

Course.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Botany, . . . . .	50 I.	3	I.	French 25 or 28, } or German 25 or 28, } Chemistry 25, . . . . .	. . . 3 . . . 3 . . . 3 . . . 3	Entomology 50, . . Entomology 53, . . Botany 50 or 52, . . Zoology 50 or 53, . . or Chemistry 51, . . . . .	. . . 3 . . . 5 . . . 3 . . . 3 . . . 8	Entomology 76, Vegetable gardening 50, . . Horticulture 50, . . . . .	. . . 5 . . . 3 . . . 5
Entomology, . . . . .	53 I.	3							
Botany, . . . . .	50 I.	3							
Entomology, . . . . .	52 II.	3							
Entomology, . . . . .	53 I.	5	II.	French 26 or 29, } or German 26 or 29, } Entomology 26, . . . . . Botany 26, . . . . .	. . . 3 . . . 3 . . . 3 . . . 3	Entomology 52, Entomology 54, Microbiology 50, . . . . .	. . . 3 . . . 3 . . . 5	Entomology 77, Entomology 90, . . . . .	. . . 3 . . . 3
Entomology, . . . . .	54 II.	3							
Entomology, . . . . .	53 III.	3							
Entomology, . . . . .	75 III.	4							
Entomology, . . . . .	70 I.	5	III.	French 27 or 30, } or German 27 or 30, } Entomology 27, . . . . .	. . . 3 . . . 4 . . . 3 . . . 2	Entomology 55, Entomology 75, Horticulture 27, . . . . . Pomology 79, . . . . .	. . . 3 . . . 4 . . . 3 . . . 3	Entomology 78, Horticulture 51, . . . . . Pomology 78, . . . . .	. . . 4 . . . 5 . . . 3
Entomology, . . . . .	77 II.	3							
Entomology, . . . . .	78 III.	4							
Entomology, . . . . .	90 II.	3							
Zoology, . . . . .	50 I.	3	IV.						
or Zoology, . . . . .	53 I.	3							
or Chemistry, . . . . .	51 I.	8							
		42 or 47							

SOPHOMORE ELECTIVE PREREQUISITES (REQUIRED). — Entomology 26 and 27, Botany 26.

ADVISED. — French or German 25 to 27 or 28 to 30, Chemistry 25; the other subjects (except Entomology) in the last three columns above are merely suggested as desirable to choose from.

**MICROBIOLOGY. (Major.)**  
**Professor CHARLES E. MARSHALL, Adviser.**

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Chemistry, .	51 I.	8	I.	Chemistry 25, . . . 3		Microbiology 50,	. . 5	Microbiology 81,	. . 5
Chemistry, .	52 II.	8		German or French 25 or 28, 3		Chemistry 51, .	. . 8	Microbiology 82,	. . 5
Microbiology,	50 I.	5						Microbiology 83,	. . 5
or									
Microbiology,	50 II.		II.	German or French 26 or 29, 3		Microbiology 51,	. . 5	Microbiology 75,	. . 5
or						Chemistry 52, .	. . 8	Microbiology 80,	. . 5
Microbiology,	50 III.					Microbiology 50,	. . 5	Dairying 75,	. . 5
or									
Microbiology,	51 II.	5							
or			III.	Chemistry 27, . . . 5		Microbiology 50,	. . 5	Microbiology 76,	. . 5
Microbiology,	51 III.	5		German or French 27 or 30, 3		Microbiology 51,	. . 5		
or				Physics 27, . . . 5		Microbiology 52,	. . 5		
Microbiology,	81 I.		IV.						
or									
Microbiology,	82 I.	5							
or									
Microbiology,	83 I.								
or									
Microbiology,	80 II.	5							
or									
Microbiology,	75 II.								
or									
Dairying, .	75 II.								
or									
Microbiology,	76 III.	5							
		46							

SOPHOMORE ELECTIVE (RECOMMENDATIONS). — German or French 25 or 28, 26 or 29, 27 or 30, Chemistry 25 and 27, and Physics 27.

ADDITIONAL INFORMATION. — The rest of the sophomore electives allowed are left for the student to choose. Microbiology 51, fall term, will be taken by students who have had Microbiology 50 at any previous time and by those who are permitted to omit Microbiology 50.

## RURAL JOURNALISM. (Major.)

— — — — — Adviser.

[The heavy-faced type indicates the term in which the course is given.]

Course.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Rural Journalism, . . . . .	50 I.	3	I.			Journalism 50, . . . . .	3	Journalism 77, . . . . .	3
Rural Journalism, . . . . .	51 II.	3				Journalism 53, . . . . .	3	Journalism 80, . . . . .	4 (5)
Rural Journalism, . . . . .	52 III.	3				Economics and Sociology 51, 5	5		
Two out of three: —									
Rural Journalism, . . . . .	53 I.	3	II.	Economics and Sociology 26, 5		Journalism 51, . . . . .	3	Journalism 78, . . . . .	3
Rural Journalism, . . . . .	54 II.	3				Journalism 54, . . . . .	3	Journalism 81, . . . . .	4 (5)
Rural Journalism, . . . . .	55 III.	3							
Two out of three: —									
Rural Journalism, . . . . .	77 I.	3	III.			Journalism 55, . . . . .	3	Journalism 79, . . . . .	3
Rural Journalism, . . . . .	78 II.	3				Journalism 52, . . . . .	3	Journalism 82, . . . . .	4 (5)
Rural Journalism, . . . . .	79 III.	3				Agricultural Economics 51, 5	5		
One from: —									
Entomology, . . . . .	90 II.								
or									
Animal Husbandry, . . . . .	53 III.	3							
Landscape, . . . . .	75 I.								
Chemistry, . . . . .	87 III.								
All: —									
Rural Journalism, . . . . .	80 I.	4 (5)							
Rural Journalism, . . . . .	81 II.	4 (5)							
Rural Journalism, . . . . .	82 III.	4 (5)							
Rural Sociology, . . . . .	78 II.	5	IV.						
Agricultural Economics, . . . . .	51 III.	5							
Economics and Sociology, . . . . .	51 I.	5							
		45-47							

SOPHOMORE PREREQUISITES. — All sophomore English.

SOPHOMORE RECOMMENDATIONS. — French or German; Drawing 25. For agricultural journalism especially: Animal Husbandry 25, 26, Chemistry 30, Entomology 26, 27.

AGRICULTURAL ECONOMICS. (Major.)  
Professor ALEXANDER E. CANCE, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

COURSE.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Agricultural Economics, . . . .	50 I.	5	I.			Agricultural Economics 50, 5		Agricultural Economics 77, 5	
Agricultural Economics, . . . .	52 II.	5				Economic Sociology 51, . 5		Agricultural Economics 79, 5	
Agricultural Economics, . . . .	53 III.	5						Farm Management 76, . 3	
Agricultural Economics, . . . .	78 III.	3							
Agricultural Economics, . . . .	76 II.	5	II.			Agricultural Economics 52, 5		Agricultural Economics 76, 5	
Agricultural Economics, . . . .	79 I.	5				Rural Sociology 51, . . 3		Rural Sociology 78, . . 5	
or						Economic Sociology 50, . 5			
Agricultural Economics, . . . .	77 I.	5							
Economic Sociology, . . . .	51 I.	5							
Economic Sociology, . . . .	50 II.	5	III.			Rural Sociology 52, . . 3		Agricultural Economics 78, 3	
Farm Management, . . . .	76 I.	3				Agricultural Economics 53, 5			
Rural Sociology, . . . .	51 II.	3							
or									
Rural Sociology, . . . .	52 III.	5	IV.						
Rural Sociology, . . . .	78 II.	5							
		49							

ADDITIONAL INFORMATION. — The sophomore electives are left to the student to choose. Animal husbandry is suggested for terms I. and II., and Economic Sociology for term III.

## AGRICULTURAL EDUCATION. (Major.)

Professor WILLIAM R. HART, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

Course.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Agricultural Education (Educational Psychology).	50 I.	5	<b>I.</b>	Animal Husbandry 25,	3	Agricultural Education 50,	5	Agricultural Education 75,	3
Agricultural Education (Principles of Teaching).	51 I.	5		Rural Engineering 25,	2	Agricultural Education 51,	5	Agricultural Education 80,	1-5
Agricultural Education (History and Philosophy).	52 III.	5						Agricultural Education 76,	3
Agricultural Education (Secondary Education).	75 I.	3	<b>II.</b>	Entomology 26,	3	Agricultural Education 51,	5	Agricultural Education 76,	3
Agricultural Education (Methods in Vocational Agriculture).	76 I.	3		Rural Engineering 26,	2			Agricultural Education 77,	5
Agricultural Education (Methods in Vocational Agriculture).	76 III.	3		Animal Husbandry 26,	3			Agricultural Education 80,	1-5
Agricultural Education (county agent work).	77 II.	5	<b>III.</b>	Entomology 27,	3	Agricultural Education 52,	5	Agricultural Education 76,	3
Agricultural Education (county agent work).	77 III.	5		Horticulture 27,	3	Agricultural Education 51,	5	Agricultural Education 77,	5
Agricultural Education (apprentice teaching).	80 I.	1-5						Agricultural Education 80,	1-5
Agricultural Education (apprentice teaching).	80 II.	1-5	<b>IV.</b>						
Agricultural Education (apprentice teaching).	80 III.	1-5							
Agricultural Education (apprentice teaching).	80 IV.	1-5							

Courses available in the Summer School: Agricultural Education 51, 75, 76, 80, and special courses leading to positions as supervisors and directors of agricultural teaching and to college positions in Agricultural Education.

ADDITIONAL INFORMATION. — Courses 50, 51, 76 and 80 or their equivalents are required of all candidates for teaching; credits vary from 14 to 18. Courses 51 and 77 are required of all candidates for county agent work. Students who are intending to teach are recommended to take as many of the sophomore electives listed above as possible in the sophomore year. Programs for juniors and seniors are planned on the basis of individual needs, with a view to the most desirable preparation for the attainment of the student's aim. Some of the aims for which programs are planned are as follows: teaching vocational agriculture; teaching non-agricultural subjects in vocational agricultural schools and departments; teaching agriculture in high schools not of the vocational type; county agent work and Junior Extension work; directing physical education and county Y. M. C. A. work; rural school supervision and rural leadership; positions as supervisors and directors of agricultural teaching; and college positions in Agricultural Education.



## RURAL SOCIOLOGY. (Major.)

Professor JOHN PHELAN, *Adviser.*

[The heavy-faced type indicates the term in which the course is given.]

Course.	Number.	Credit.	Term.	Sophomore.	Credit.	Junior.	Credit.	Senior.	Credit.
Agricultural Economics,	50 I.	5	I.			Agricultural Economics 50, 5	5	Economics and Sociology 75, 5	
Agricultural Economics,	52 II.	5				Rural Sociology 50, 3			
Economics and Sociology,	51 I.	5				Economic Sociology 51, 5			
Economics and Sociology,	75 I.	5							
Economic Sociology,	77 III.	5	II.			Rural Sociology 51, 3	3	Rural Sociology 77, 3	3
Rural Journalism,	55 III.	3				Agricultural Economics 52, 5			
						Agricultural Education 52, 5			
Rural Sociology,	50 I.	3	III.			Rural Journalism 55, 3	3	Economic Sociology 77, 5	5
Rural Sociology,	52 III.	3				Rural Sociology 52, 3			
Rural Sociology,	51 II.	3							
Rural Sociology,	77 II.	3	IV.						
Agricultural Education,	52 II.	5							
or									
Rural Sociology,	78 II.	5							
		45							

ADDITIONAL INFORMATION. — The sophomore electives allowed are left to the student to choose.



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# DESCRIPTION OF COURSES

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# DESCRIPTION OF COURSES.

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## DIVISION OF AGRICULTURE.

Professor FOORD.

[Heavy-faced Roman numerals indicate the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

**AGRICULTURE AND HORTICULTURE.** Freshmen. This course continuing through the year constitutes the required elementary work dealing with the foundations of the subjects of live stock and the crops of the field, orchard and the garden. Several departments collaborate in giving the work; three credits each term are assigned to this course. For a description of the work see —

Agronomy 1, I.  
Animal Husbandry 1, II.  
Horticulture 1, I.  
Poultry Husbandry 1, II.

### **Agronomy.**

Professor BEAUMONT, Assistant Professor —, Mr. THELIN, Mr. THAYER.

The courses in agronomy are designed to give the student fundamental knowledge concerning the soil and the principal products of the field. The basic course in soils is required of all students. The electives purpose to meet the needs of those specializing in soils and field crops and other specialized fields including both pure and applied science.

The laboratories for soils and fertilizers include one for elementary work, supplied with locker equipment for 200 students, and one for advanced work, accommodating 80 students. These laboratories are equipped with steam and electric ovens, balances, centrifuge, microscopes and other apparatus necessary for a study of soils and fertilizers. Storerooms, stock rooms, and balance rooms are located convenient to the laboratories. There is also a workroom attached, equipped with power machinery for grinding soils, fodders and the like.

The crops' laboratories include one for seed study, having a locker equipment for 50 students, and a laboratory for the study of cereals, forage crops, roots, etc., with lockers for 64 students. The equipment of these laboratories includes steam ovens, constant temperature electric ovens, ovens for seed germination, Brown-Duval moisture apparatus, balances, microscopes, and collections of seeds, grasses, tubers, weeds, etc. A balance room, root cellar and two storerooms, one of which is mouse-proof, are also used for crop work.

A modern steam-heated greenhouse 25 by 35 feet, used for work in soils and crops, is a valuable part of the equipment. Near the greenhouse is a crop garden on which different varieties of corn, grasses, clovers, etc., are grown for

demonstration purposes, and as a source of material for class work. In addition, the general college farm of 250 acres is used for field study in soils and crops, and as a source of material.

*Required Courses.*

1. **I. AGRONOMY.**—Freshmen. Given as part of the freshman agriculture and horticulture. This course aims, by actual contact with the plants and the plant products, to make the students familiar with the common field, garden and orchard crops of Massachusetts.

Assistant Professor — and the DEPARTMENT.

27. **III. SOILS AND FERTILIZERS.**—Sophomores. A study of soils and their properties, soil management, methods of soil improvement and maintenance of fertility, including the use of farm manures, commercial fertilizers and soil amendments.

4 class hours.

1 2-hour laboratory period, credit, 5.

Professor BEAUMONT and the DEPARTMENT.

Prerequisites, Freshman-required Chemistry.

*Elective Courses.*

50. **I. FIELD AND FORAGE CROPS.**—For juniors; seniors may elect. History, classification and production of corn and of those grasses, legumes, root and tuber crops suited to New England conditions. Crops of less importance in New England are briefly considered. The work includes lecture, laboratory and field study.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Assistant Professor — and the DEPARTMENT.

Prerequisites, Agronomy 27, Botany 3.

51. **III. ADVANCED FIELD CROPS.**—For juniors; seniors may elect. Study of the cereals and other field crops not taken up or only briefly considered in Course 50. General problems of crop production are also considered, and the work is not entirely confined to New England conditions. The laboratory work includes a study of the cereals, the quality of seeds, grains and crop products, crop problems and field work with such crops as are available.

2 class hours.

1 2-hour laboratory period, credit, 3.

Assistant Professor — and the DEPARTMENT.

Prerequisite, Agronomy 50.

75. **I. ADVANCED SOILS.**—For seniors; juniors may elect. A field, lecture and laboratory course on soils and their adaptability to different uses. The field work consists of a detailed study of soil textures, natural and spontaneous vegetation and other factors which indicate the fertility and adaptation of the soil; accompanied by a laboratory study of the physical properties of the soils sampled.

2 class hours.

1 4-hour and 1 2-hour laboratory period, credit, 5.

Professor BEAUMONT and Mr. THELIN.

Prerequisite, Agronomy 27. Advised, Geology, 27.

77. **II. MANURES AND FERTILIZERS.** — Seniors. An advanced course, giving a general discussion of the different theories which have been <sup>1</sup> relative to the functions and importance of manures and fertilizers, and <sup>2</sup> to the views at present accepted. Considerable attention is devoted to consideration of the experimental work which has been done, and which is now in progress. The laboratory work consists of a study of fertilizers, fertilizer mixtures, limes and culture work.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Professor BEAUMONT and Mr. THELIN.

Prerequisite, Agronomy 27. Advised, Chemistry 27.

78. **II. BREEDING OF FIELD CROPS.** — Seniors. This course deals with the improvement, by selection and breeding, of the crops studied in Courses 50 and 51.

2 class hours.

1 2-hour laboratory period, credit, 3.

Assistant Professor —.

Prerequisite, Agronomy 51.

### **Animal Husbandry.**

Professor SALISBURY, Assistant Professor RICE, MR. THAYER.

It is the purpose of this department to give students a broad, comprehensive knowledge of the subject of animal husbandry. The courses are arranged so that a student first studies the breeds of live stock and types and market classes of live stock. These courses are followed with courses in judging, breeding, feeding and management, so that the student has an opportunity to secure a thorough training in animal husbandry.

The department is equipped with an excellent laboratory, Grinnell Arena, which has a seating capacity of 180, and which is fully adapted to the requirements. There are upwards of 125 head of dairy cattle of various ages available for classroom work; among these are included superior representatives of the Jersey, Guernsey, Ayrshire and Holstein, of the best breeding and individuality. Considerable numbers of pure-bred Berkshire and Chester White pigs are maintained. The college possesses pure-bred Percherons besides several work teams of different types, which are available for classroom purposes. A set of plaster of Paris models of individuals of foreign and domestic breeds of horses, cattle, sheep and swine, and a collection of the different foodstuffs available for the use of the New England farmer, are included in the equipment for this work. An excellent set of upward of 250 lantern slides portraying the leading prize-winning, producing and breeding animals of the leading breeds, — horses, cattle, sheep and swine, — belongs to this department, and is regularly used in instructional work. This equipment is being added to from time to time as funds are available.

#### *Required Course.*

1. **II. ANIMAL HUSBANDRY.** — Freshmen. Given as part of the freshman agriculture and horticulture. This course acquaints the student with the foundations of the live-stock industry. In the lectures the types and

major classes of farm animals, and their uses, are considered; in the laboratory period elementary judging practice familiarizes the student with animals of various types.

1 class hour.

1 2-hour laboratory period, credit, 2.

Mr. THAYER.

*Elective Courses.*

25. **I. TYPES AND BREEDS OF LIVE STOCK.** — Sophomores. A course covering the origin, history, development and characteristics of the different breeds of horses, cattle, sheep and swine. Textbook, Plumb's "Breeds and Types of Farm Animals."

2 lectures.

1 2-hour laboratory period, credit, 3.

Professor SALISBURY and Mr. THAYER.

26. **II. TYPES AND BREEDS OF LIVE STOCK.** — Sophomores. Continuation of Course 25.

2 lectures.

1 2-hour laboratory period, credit, 3.

Professor SALISBURY and Mr. THAYER.

Prerequisite, Animal Husbandry 25.

50. **I. FEEDING AND MANAGEMENT.** — For juniors. A study of the principles of animal nutrition; of the composition and qualities of feeding materials. Textbook, Henry's "Feeds and Feeding."

3 class hours.

Credit, 3.

Assistant Professor RICE.

Prerequisite, Chemistry 30 or 51.

51. **II. FEEDS AND FEEDING.** — For juniors. A study of feeding practice as related to all farm animals. Considerable work will be given in the formulating of rations.

3 class hours.

Credit, 3.

Assistant Professor RICE.

Prerequisite, Animal Husbandry 50.

52. **III. ADVANCED STOCK JUDGING.** — For juniors; seniors may elect. This course is designed to equip animal husbandry students in the judging of classes of different types of live stock; to strengthen them in the selection of superior sires; and equip them for stock judging at fairs. Visits will be made to the best herds for the various breeds of stock in the State. Judging teams to represent the college will be selected from this class.

1 2-hour and 1 4-hour laboratory period, credit, 3.

Professor SALISBURY.

Prerequisite, Animal Husbandry 25 and 26.

53. **III. PRINCIPLES OF BREEDING.** — For juniors; seniors may elect. This course is designed to familiarize the student with the problems that are involved in animal improvement; to acquaint him with the facts which are already established; to scrutinize prevailing theories; and to indicate the lines and methods of further work. Some of the subjects studied are: variations,



their causes and heritability; DeVrie's theory of mutations; the inheritance of acquired characters; the pure line; Mendelian law; the making of new types; the determination of sex; applications to human heredity. A few periods at the end of the course are devoted especially to the application of principles in live-stock improvement. Supplementary reading.

3 class hours.

Credit, 3.

Assistant Professor RICE.

Prerequisite, Zoölogy 25.

75. **I. LIVE-STOCK MANAGEMENT.** — For seniors. The work of this course consists of laboratory work by the individual students in the handling of live stock; with horses, such work as halter breaking, harnessing, casting and fitting for show will be done; similarly, the practical handling of cattle, sheep and swine will be fully treated. Special study is given to halter making, splicing, hitches, knots and all rope work.

2 lectures.

1 2-hour laboratory period, credit, 3.

Professor SALISBURY.

Prerequisites, Animal Husbandry 50 and 51.

78. **II. HERD AND STUD-BOOK STUDY.** — For seniors; juniors may elect. An advanced course in the study of the breeds of live stock, familiarizing the student with the detailed history of the breed, the most productive sires and dams of the various breeds, and the successful lines and methods of breeding.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professor SALISBURY.

Prerequisite, Animal Husbandry 53.

80. **III. SEMINAR.** — For seniors majoring in animal husbandry only. Advanced study upon questions pertaining to live stock and live-stock production. Each student electing this work will choose some particular line of work in which he is specially interested, and will pursue study in this subject by reading, compilation and research. There will be no regular lecture period, but seminars will be held. A satisfactory report of the results must be presented in a thesis.

1 2-hour laboratory period, credit, 1.

Professors SALISBURY and RICE.

### Dairying.

Professor LOCKWOOD, Professor JUDKINS, Assistant Professor YAXIS, Mr. UPTON.

The dairy manufactures building is new, well lighted and of sanitary construction. It is designed and equipped especially for teaching dairy manufactures. The equipment includes all kinds of machinery that are considered essential to the proper handling of milk and the making of cream, butter, ice cream and soft cheeses.

Course 77 is given for students who wish to get a general idea of dairy work and manufacturing processes. Part of the courses are arranged to give instruction in general dairy work as associated with Massachusetts agriculture; part are arranged to give to a smaller group of students more complete work in manufactures.

*Elective Courses.*

50. **I. MILK AND MILK COMPOSITION.** — For juniors; seniors may elect. The development of the dairy business in the United States; the composition, secretion and general characteristics of milk; contamination and fermentation; the study of analysis of milk products by use of the Babcock test for fat, tests for acidity and adulteration, and ordinary preservatives; moisture tests for butter; methods for testing herds and developing them to higher efficiency; problems.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Professors JUDKINS and YAXIS.

51. **III. BUTTER MAKING.** — For juniors; seniors may elect. A study of separators and cream separation; handling milk and cream for butter making; preparation of starters, and ripening cream; churning; markets and their requirements; marketing, scoring and judging butter; management; problems; dairy machinery and care thereof.

2 class hours.

2 3-hour laboratory periods, credit, 5.

Professor JUDKINS.

Prerequisite, Dairying 50.

75. **II. MARKET MILK.** — For seniors; juniors may elect. A study of market-milk conditions; extent and development of the business; supply and delivery; food value of milk and its uses as food; milk and its relation to the public health; proper methods for handling milk and cream for direct consumption; certified milk, requirements and production; pasteurizing; sterilizing; standardizing and modifying; milk laws and inspection.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Professor JUDKINS.

Prerequisite, Dairying 50.

76. **III. MILK PRODUCTS.** — For seniors; juniors may elect. The manufacture of milk products other than butter, including cheddar cheese, soft and fancy cheese, ice cream, condensed milk, casein, milk powder, etc. Laboratories, largely the making of soft and fancy cheese and ice cream.

2 class hours.

2 3-hour laboratory periods, credit, 5.

Mr. UPTON.

Prerequisite, Dairying 75.

77. **I. DAIRYING.** — For seniors; juniors may elect. A general course designed primarily for students who wish to take only one course in dairying. The work given will cover briefly the composition and secretion of milk, the Babcock fat test, the relation of bacteria to dairy work and principles of creaming; separators; elementary butter making; proper methods of handling milk and cream; and the relation of market milk to the public health.

3 lecture hours.

2 2-hour laboratory periods, credit, 5.

Professor JUDKINS.

### Farm Management.

Professor FOORD, Assistant Professor ABELL.

The purpose of the courses in this department is to introduce the student to a consideration of farming as a business. This involves a knowledge of the cost of production and the profit from the different enterprises such as dairy, poultry or orchard, and a study of the enterprises, and the relative amounts of each that will give the best use of labor and equipment on the farm under consideration.

The college farm of 250 acres is under the general supervision of the Department of Farm Management, and furnishes demonstration material. It includes improved land, pasture land and a farm wood lot. The improved land illustrates the value of good culture and the best known methods for the maintenance of fertility. The farm is equipped with suitable buildings and good machinery for the work carried on, of which the production of certified milk is an important branch. Several good farms in the vicinity, illustrating types of both special and general agriculture, may be inspected and studied. The offices of the department are in Stockbridge Hall.

75. **I. FARM ACCOUNTS AND COST ACCOUNTING.** — For seniors; juniors may elect. A study of farm inventories, single-enterprise accounts, complete farm accounts and farm records. Special emphasis is given to the interpretation of results and their application in the organization and management of the farm.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professors FOORD and ABELL.

76. **I. FARM MANAGEMENT.** — For seniors; juniors may elect. A study of farming as a business; regions and types of farming; the general principles of farm management and the influence of size, production, live stock and crop farming on the farmer's labor income; arrangement of fields and buildings; use of land, capital and labor; choosing and buying a farm.

2 class hours.

1 2-hour laboratory period, credit, 3.

Assistant Professor ABELL.

Prerequisites, Agronomy 50, Animal Husbandry 25 and 26, and some farm experience.

77. **III. FARM MANAGEMENT.** — For seniors; juniors may elect. A further and more specific study of the principles and practices as outlined in Course 76, with reference to their application to different regions of the United States and especially to New England. Trips to successful farms will be a required part of the course.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professors FOORD and ABELL.

Prerequisites, Farm Management 75 and 76.

78. **II. SEMINAR.** — For seniors majoring in general agriculture; others by arrangement.

1 class hour.

Credit, 3.

The DEPARTMENT.

79. **III. SEMINAR.** — For seniors majoring in general agriculture; others by arrangement.  
1 class hour.

Credit, 3.

The DEPARTMENT.

### Poultry Husbandry.

Professor GRAHAM, Professor PAYNE, Dr. GOODALE, Assistant Professor BANTA, Mr. RYAN.

The introductory courses (1, 50, 51, 52, 53, 54) give a knowledge of the general routine of elementary poultry keeping. The advanced studies prepare men for the successful operation of poultry plants, either as owners or managers. In the graduate work further preparation may be secured for teaching, extension or investigation.

The poultry plant consists of 8 acres of land sloping gently to the west. The buildings consist of three incubator cellars equipped with a number of lamp incubators and two mammoth machines with a total capacity of 9,000 eggs; a pipe brooder house (open pipe system) and 40 colony brooder houses which give a brooding capacity for 7,000 chicks, the equipment for these houses including a large variety of coal-stove brooders and kerosene hovers; a long laying house 14 by 180 feet, which accommodates 500 layers, furnishing facilities for student work in pen management, utility and fancy judging, etc.; and a laboratory 14 by 80, for killing, picking, drawing, trussing, packing, crate fattening and cramming. The fattening equipment consists of a modern sanitary all-steel battery with 16 compartments and 10 wooden crates, accommodating, altogether, 350 birds. There are also a storage building, 28 by 64 feet, for root cellar, poultry carpentry, poultry mechanics, feed room and storage; an experimental breeding house, 18 by 60; a combination laying, testing and breeding house, 18 by 72, for experimental purposes; a model laying house, 18 by 30, for 100 hens, and a house 20 by 40, for 200 hens. The six old experiment-station houses, each 12 by 18 feet, are used as special mating and overflow pens. The total capacity for laying hens is 1,600. A manure shed 14 by 18 feet; an oil and tool house 10 by 12; an incinerator 10 by 10; and two backyard model poultry houses 8 by 10 and 8 by 8 give a total of 76 buildings, not including a pheasant run, 16 roosting sheds 10 by 10, and numerous small coops for natural incubation and brooding.

#### *Required Course.*

1. **I. POULTRY HUSBANDRY.** — Given as part of the freshman agriculture and horticulture. The object of this course is to familiarize the student in a general way with the fundamental principles of poultry husbandry, — breeds and varieties of poultry, types of houses, feeds and feeding, management, marketing and the principles of incubation and brooding.

1 2-hour period, credit 1.

Assistant Professor BANTA.

#### *Elective Courses.*

50. **I. ELEMENTS OF POULTRY CULTURE.** — For juniors; seniors may elect. This course consists of a comprehensive study of opportunities in poultry culture, poultry-house construction, poultry-house equipment, feeds and feeding, winter-egg production, types and breeds of poultry.  
3 class hours.

Credit, 3.

Professor GRAHAM, Professor PAYNE and Assistant Professor BANTA.

**51. I. POULTRY PRACTICE WORK.** — For juniors; seniors may elect. This is a practical laboratory course providing a study of external parasites, insecticides, poultry carpentry, caponizing, killing and picking; dressing and packing poultry.

2 2-hour laboratory periods, credit, 2.

Professor PAYNE.

Prerequisite, must be accompanied by Poultry 50.

**52. II. ELEMENTS OF POULTRY CULTURE.** — For juniors; seniors may elect. This course treats the subjects of incubation, brooding, care of growing stock, breeding for egg-production and diseases of poultry.

3 class hours.

Credit, 3.

Professor PAYNE and Assistant Professor BANTA.

Prerequisite, Poultry 50.

**53. III. INCUBATION AND BROODING.** — For juniors; seniors may elect. In this course students are required to set up and operate incubators and brooders, make a systematic study of the development of the chick in the egg and the care of sitting hens. Laboratory time by arrangement.

1 class hour.

4 2-hour laboratory periods, credit, 5.

Professor PAYNE.

Prerequisite, Poultry 52.

**54. III. PEN MANAGEMENT.** — For juniors; seniors may elect. This is a practical laboratory course. Students are required to care for a pen of fowls, keeping accurate records of eggs produced, food consumed, weather conditions, health of fowls and profit and loss.

1 2-hour laboratory period, credit, 1.

Assistant Professor BANTA.

Prerequisite, Poultry 50.

**55. I, II and III. INVESTIGATIONAL WORK.** — Seniors. This course is designed especially for students who are planning to do experiment station work. Students will be assigned specific problems to work out experimentally, or they may be required to assist in carrying on such work.

1 to 5 2-hour laboratory periods, credits, 1 to 5.

Dr. GOODALE.

**75. II. POULTRY MANAGEMENT.** — Seniors. A detailed study of large poultry farms and their equipment, such as bone cutters, feed cutters, cramming machines, etc.; the laying out and planning of poultry buildings of all kinds; mating of fowls. Attention to poultry diseases and investigation work carried on by experiment station is prominent. A few good poultry plants will be visited by the class for practical demonstrations.

5 class hours.

Credit, 5.

Professor GRAHAM.

Prerequisites, Poultry 53, 54, 76 and 77.

76. **I. ADVANCED POULTRY JUDGING.**—Seniors. This course includes a study of the origin and history of breeds and varieties, poultry organizations and poultry shows. The laboratory work covers score card and comparative judging of exhibition and utility poultry; conditioning show birds, and applying the latest methods of selecting high and low producing hens. A few of the best Connecticut Valley poultry shows will be visited by the class. The American Standard of Perfection will be used as a text.

2 class hours.

3 2-hour laboratory periods, credit, 5.

Assistant Professor BANTA.

Prerequisite, Poultry 53.

77. **I. MARKET POULTRY AND POULTRY PRODUCTS.**—Seniors. This course includes the study of market classifications of poultry, eggs and feathers, the requirements of different markets, methods of marketing, advantages and disadvantages of cold storage of poultry and eggs. Students will be required to fatten several lots of chickens by different methods and rations. Accurate data must be kept showing the gain in weight and quality, also the cost of feed, labor, etc., and the profit and loss. Preserving eggs, judging and scoring of market poultry, both alive and dressed, and market eggs will be an important feature of this course.

2 class hours.

3 2-hour laboratory periods, credit, 5.

Professor PAYNE.

Prerequisites, Poultry 50, 51 and 52.

78. **III. FARM POULTRY.**—Seniors; juniors may elect. This course is offered for those students who desire a general knowledge of poultry husbandry, but who cannot devote more than one term to the subject. It is not intended for students specializing in poultry, and such students are admitted only by special permission. Emphasis will be placed on the farm flock and its economic management. Utility classification, housing, culling, feeding, hatching, rearing, production, marketing and disease control will receive special consideration.

3 class hours.

2 2-hour laboratory periods, credit, 5.

The DEPARTMENT.

### **Rural Engineering.**

Professor GUNNESS, Assistant Professor STRAHAN, Mr. PUSHEE, Mr. NEWLON.

The courses in rural engineering are planned to give a working knowledge of those phases of engineering which apply directly to the farm. It is expected that the student will get a clear understanding of modern farm practice as it relates to permanent improvements of the farm and the farmstead, and in the selection and use of farm equipment.

This department has an office and the use of a lecture room in Stockbridge Hall. The work on farm structures is given in the large drawing room in the same building. This room is fitted with thirty drawing tables. Models and blue prints are available for the study of farm buildings. A set of post molds and a machine for making cement tile afford opportunity for practical work with cement.

The rural engineering shop building is a one-story structure 68 by 126 feet. The carpenter shop in this building is fitted with benches fully equipped with

tools for each student. A saw table is available for getting out material. The general repair shop is equipped with forges, benches, a drill press and grinders. The laboratory for farm machinery and farm motors is equipped with a complete line of field machines, gasoline engines, tractors and pumps. A complete assortment of engine accessories, consisting of carburetors, magnetos, etc., is available for thorough instruction in gas engines. A small dynamo and switchboard are used in the study of farm-lighting systems. The work on the small field machines is given in the basement of Stockbridge Hall, and the work on steam engines and steam heating is given in Flint Laboratory.

*Elective Courses.*

25. **I and III. CARPENTRY.** — For sophomores; juniors and seniors may elect. Practice in the use of tools by exercises in bench work, repair of farm equipment and farm building construction.

2 2-hour laboratory periods, credit, 2.

Mr. PUSHEE.

26. **II and III. REPAIR OF FARM EQUIPMENT.** — For sophomores; juniors and seniors may elect. Exercises in forge work, pipe fitting, soldering, babbitting and fitting bearings, lining up shafting, lacing belts and splicing rope. Practice in the use of machinist's tools, such as file, cold chisel, drill press, taps and dies.

2 2-hour laboratory periods, credit, 2.

Mr. NEWLON.

75. **I.** For seniors; juniors may elect. Study of the strength and durability of building materials; water supply; lighting and heating systems for the farm; lightning protection; drawing plans, writing specifications and estimating the cost of buildings; concrete construction as applied to foundations, silos, tanks, posts, floors and walks.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Assistant Professor STRAHAN.

77. **II. POWER MACHINERY.** — For seniors; juniors may elect. Steam and gasoline engines, refrigerating machinery, electric motors and dynamos. Practice in pipe fitting, soldering, babbitting and fitting bearings, lacing belts and packing valves. Course 77 is intended primarily for dairy students, but would be valuable to any man who would expect to use engines, pumps or electrical machinery.

2 class hours.

3 2-hour laboratory periods, credit, 5.

Professor GUNNESS.

78. **III. FARM MACHINERY.** — For seniors; juniors may elect. Study of the care and operation of tillage, seeding, harvesting, pumping and spraying machinery; steam and gas engines and gas tractors. Special attention will be given to the use of power on the small farm.

2 class hours.

3 2-hour laboratory periods, credit, 5.

Professor GUNNESS.

79. **III. DRAINAGE AND IRRIGATION ENGINEERING.**—For seniors; juniors may elect. This course covers the engineering phase of drainage and irrigation. The various systems are studied, and practice is given in the design of drainage and irrigation systems. Field work gives practice in surveying for drains, platting, locating drains, erecting batterboards and laying tile. Practice is given in assembling equipment for spray irrigation, and the flow of water through nozzles is studied by means of laboratory tests.

2 class hours.

3 2-hour laboratory periods, credit, 5.

Assistant Professor STRAHAN.



## DIVISION OF HORTICULTURE.

PROFESSOR WAUGH.

[Heavy-faced Roman numerals indicate the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

### Floriculture.

PROFESSOR THAYER.

The courses in floriculture are intended to give the student a general knowledge of all phases of greenhouse design, construction, heating and management, the culture of florists' crops (under glass and in the field), floral decoration and arrangement. The department aims to train students so that they may take up commercial floriculture (either in the growing or retail business) and the management of conservatories on private estates, in parks and cemeteries.

The department is especially well equipped for the teaching work, probably being surpassed in no other agricultural college. French Hall, with its laboratories, classrooms and offices, furnishes excellent facilities for the purposes of instruction. The glass area of the department consists of approximately 20,000 square feet, divided as follows: French Hall range of 7,200 square feet, a durable, practical, commercial range composed of palm and fern, violet, carnation, rose and students' houses; the old Durfee range of 7,400 square feet, devoted to the growing of decorative, conservatory and bedding plants and chrysanthemums; one house of 3,200 square feet, suitable for propagating work and general plant culture; and approximately 2,200 square feet in cold frames and hotbeds.

In addition, the department has 2 acres of land used for the summer culture of carnations, violets, gladioli, dahlias, sweet peas, bedding plants, etc. This also includes a small garden of about 4,700 square feet devoted to the culture of annuals. A large collection of biennials and herbaceous perennials is maintained and is being enlarged from year to year; at the present time the collection consists of several hundred species and varieties, and provides an excellent opportunity for the study of garden flowers.

### *Elective Courses.*

50. I. GREENHOUSE MANAGEMENT. — For juniors; seniors may elect. This course is designed to familiarize students with the methods followed in the management of greenhouse crops. The students are instructed in the practical operations of watering, potting, fumigating, ventilating and in the methods of propagation of plants. In addition the use of cut flowers and plants in decorative work, arrangement of flowers in baskets, designs, vases, table and home decorations will be considered. Students will be expected to arrange their hours according to the needs of the work.

2 class hours.

1 4-hour laboratory period, credit, 4.

PROFESSOR THAYER.

Prerequisite, Horticulture 27.

51. **II. GREENHOUSE MANAGEMENT.** — For juniors; seniors may elect.  
Continuation of Course 50.

2 class hours.

1 4-hour laboratory period, credit, 4.

Professor THAYER.

Prerequisite, Floriculture 50.

52. **III. GREENHOUSE MANAGEMENT.** — For juniors; seniors may elect.  
A continuation of Courses 50 and 51.

2 class hours.

1 4-hour laboratory period, credit, 4.

Professor THAYER.

Prerequisite, Floriculture 51.

53. **I. GREENHOUSE CONSTRUCTION.** — For juniors; seniors may elect.  
The location, arrangement, construction, cost, heating and ventilating of greenhouse structures; also the drawing of plans and drafting of specifications for commercial houses and private ranges. Such practical work as glazing, the construction of concrete benches and cold frames will be included in this course.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor THAYER.

Prerequisite, should be taken with Floriculture 50.

54. **II. GREENHOUSE CONSTRUCTION.** — For juniors; seniors may elect.  
A continuation of Course 53.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor THAYER.

Prerequisite, Floriculture 53.

75. **I. COMMERCIAL FLORICULTURE.** — Seniors. A detailed study will be made of the methods of culture for greenhouse plants and cut flowers for wholesale and retail markets. The care and marketing of all florists' crops will also be considered. Assigned readings on these topics.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor THAYER.

Prerequisite, Floriculture 52.

76. **II. COMMERCIAL FLORICULTURE.** — Seniors. As stated under Course 75.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor THAYER.

Prerequisite, Floriculture 75.

79. **III. COMMERCIAL FLORICULTURE.** — Seniors. As stated under Course 75.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor THAYER.

Prerequisites, Floriculture 76.

77. **II. CONSERVATORY WORK AND DECORATIVE PLANTS.** — Seniors. A study of the tropical and subtropical foliage and flowering plants used in conservatory work. Their arrangement and care will also be considered. Assigned readings.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor THAYER.

Prerequisite, Floriculture 75.

78. **III. GARDEN FLOWERS AND BEDDING PLANTS.** — Juniors and seniors. This course aims to make the student familiar with those annuals, herbaceous perennials, bulbs and bedding plants used in landscape work. Their propagation, culture and uses will be considered. Assigned readings and field trips.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor THAYER.

80. **III. SEMINAR.** — For seniors majoring in floriculture only. Advanced study of subjects pertaining to commercial floriculture or private garden work. All students electing this work will be assigned a specific problem, and will pursue study in these problems by reading and research. No regular lectures will be given, but seminars will be conducted each week. A satisfactory report of the results must be presented.

2 to 6 laboratory hours.

Not to exceed 3 credits.

Professor THAYER.

### **Forestry.**

Professor GROSE.

The forestry major is designed to give the student a grounding in the branches of natural science upon which forest development is based. It continues, further, to give him a knowledge of such practical forestry details as the distinguishing characteristics of the various species of trees and commercial lumber, the principles of silviculture, forest management, forest utilization, and forest nursery practice.

The department has an unusually complete equipment of the various instruments used in forest mensuration, forest mapping and engineering, timber estimating, log scaling, board measuring, etc.; and a large assortment of boards illustrative of the various commercial woods found in the lumber markets. The State Forest Nursery, comprising 6 acres of land and containing, approximately, 5,000,000 trees, transplants and seedlings, is on the college farm. Extensive forests containing every variety of tree common to New England are within walking distance of the college. The college campus affords an arboretum containing an exceptionally large number of trees not native to New England. The Mount Toby Demonstration Forest has an area of approximately 750 acres, and contains the various types of forest growth found throughout the State. It serves as a field laboratory in which students have the privilege of working out problems in silviculture, forest mensuration and management. Improvement cuttings, cuttings for utilization, and forest plantings are conducted by the forestry department, and every opportunity is offered the student to familiarize himself with the practical side of forest work.

*Elective Courses.*

50. **I. DENDROLOGY.** — For juniors; seniors may elect. During the first part of the term frequent field trips will be made to identify and study the habits of our native forest trees. Later, the classification, range, distribution, forest habits, quality, uses and identification of wood of the commercial timber trees of the United States will be studied. Lectures, recitations, laboratories or field work at option of instructor.

3 2-hour laboratory periods, credit, 3.  
Professor GROSE.

51. **II. WOOD TECHNOLOGY.** — For juniors; seniors may elect. A study of the commercial woods found in the lumber markets, methods of identification, uses, strength values, technical qualities, decay and methods of preservation.

1 class hour.

2 2-hour laboratory periods, credit, 3.  
Professor GROSE.

52. **III. PRINCIPLES OF FORESTRY.** — For juniors; seniors may elect. A lecture course for the purpose of giving the students a general view of the whole field of forestry and what forestry attempts to accomplish and has accomplished. Not required of students who propose to major in forestry.

2 class hours.

Credit, 2.  
Professor GROSE.

53. **III. SILVICULTURE.** — For juniors; seniors may elect. Factors influencing forest growth; forest types; silvicultural systems; care and protection of forests; forest description; forest nursery practice and forest planting.

1 class hour.

1 4-hour laboratory period, credit, 3.  
Professor GROSE.

Prerequisite, Forestry 50.

54. **IV. ARBORICULTURE.** — For juniors; seniors may elect. A course dealing with problems of shade tree propagation, protection and repair; the choice and grouping of species; shade tree laws. Assigned readings.

120 hours' field work, credit, 5.  
Professor GROSE.

75. **I. FOREST MENSURATION.** — For seniors; juniors may elect. Methods of determining the volume of trees, logs and entire forests. Methods of computing volume tables, tree and forest growth and yield tables. Timber estimating.

3 class hours.

72 hours' field work, credit, 5.  
Professor GROSE.

78. **III. SEMINAR — REPORT.** — Seniors. This may involve research, laboratory or field work in the investigation of some subject, together with a review of the literature relating to it and an original written report evidencing the results. Subject to be chosen in conference with Professor Clark.

6 laboratory hours, credit, 3.  
Professor GROSE.

### Horticultural Manufactures.

Professor CHENOWETH, Mr. ROBERTSON.

The courses offered aim to give the student a practical knowledge of the problems connected with food preservation. Emphasis is placed upon the conservation of the cheaper grades of fruits and vegetables, to the end that the whole crop may be marketed at a profit and that good wholesome food products may result from what would otherwise be lost.

The social and economic values of this line of work are constantly emphasized with the intent of broadening and liberalizing the students' view of these problems.

The department occupies three laboratory rooms in Flint Laboratory, two in Fisher Laboratory, with offices in Wilder Hall and French Hall. The laboratories are fitted with desks for 18 students. The desk equipment contains the necessary utensils for doing general laboratory work in food preservation. The general equipment of the department, both for the use of students and for manufacturing purposes, may be grouped under the following heads:—

1. *Canning.*—A modern canning outfit, including both steam-pressure cookers and hot-water baths, hand and power can sealers, peeling and slicing machines, a string-bean cutter, heat-penetration thermometers, electric incubator and a large assortment of all types of home canning equipment.

2. *Evaporation.*—Two small orchard evaporators, a tunnel drier, peeling machines, slicers and a general assortment of driers adapted to home evaporation.

3. *Fruit Juices, Butters, etc.*—A hand cider mill, a motor-driven hydraulic press, a steam-jacketed kettle, an apple-butter cooker, and cider and vinegar testing apparatus.

#### *Elective Courses.*

75. **I. HORTICULTURAL MANUFACTURES.**—For seniors and graduate students. A practical course in food preservation dealing primarily with fruits and vegetables. The canning of fruits and vegetables as practiced in the home and in commercial canneries; evaporation of fruits and vegetables, the various types of equipment and methods of preparation of products. The manufacture of (a) fruit products, such as butters, jams, jellies, fruit juices, marmalades, preserves, vinegars, pastes, etc.; (b) vegetable products, as pickles, piccalilli, sauerkraut, soups, etc. Particular attention will be given to study and use of all types of equipment suitable for use in the home or small factory, together with methods for testing a large variety of manufactured products. During this term the emphasis will be on canning, drying and study of equipment.

2 class hours.

3 2-hour laboratory periods per week, credit, 5.

Professor CHENOWETH.

76. **II. HORTICULTURAL MANUFACTURES.**—For seniors and graduate students. A continuation of Course 75. The emphasis in this course is placed on the manufacturing and testing of fruit and vegetable products.

1 class hour.

2 laboratory periods per week, credit, 3.

Professor CHENOWETH.

Prerequisite, Horticultural Manufactures 75.

### Horticulture.

Professor WAUGH, Assistant Professor THOMPSON.

The general subject of horticulture divides naturally into subjects of pomology, floriculture, forestry, landscape gardening and market gardening. A number of courses relate to more than one of these subjects, and are therefore grouped here under the general designation of horticulture.

#### *Required Course.*

1. **I. HORTICULTURE.** — Freshmen. Given as part of the freshman agriculture and horticulture.

#### *Elective Courses (General).*

27. **III. NURSERY PRACTICE.** — For sophomores; juniors and seniors may elect. This course treats of the fundamental methods of plant propagations by seeds, cuttings, budding, grafting, etc. Lectures and practicums.  
2 class hours. 1 2-hour laboratory period, credit, 3.

Assistant Professor THOMPSON.

50. **I. PLANT MATERIALS.** — For juniors; seniors may elect. This course aims to make the student familiar with the character of the trees, shrubs and herbaceous perennials used in ornamental work, and with the methods of propagating them.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Assistant Professor THOMPSON.

Prerequisite, Horticulture 27.

51. **III. PLANT MATERIALS.** — For juniors; seniors may elect. A continuation of Course 50, taking up the field use of trees, shrubs and herbaceous plants, their native habitats, soils and plant associations, with a view to supplying to students in landscape gardening and floriculture a knowledge of plant species. Frequent practicums and field excursions.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Assistant Professor THOMPSON.

Prerequisite, Horticulture 50.

### Landscape Gardening.

Professor WAUGH, Assistant Professor HARRISON.

The purposes of the courses in landscape gardening are: (1) to train men for the profession in all its branches. As a rule graduates should first enter the employ of established landscape architects, nurserymen or park superintendents, and after an apprenticeship of several years those who have the requisite technical and business ability may set up for themselves. (2) To train men for public-service work in national, State and municipal parks and forests. (3) To train men for country planning, this function being exercised through various public institutions and organizations. (4) To train teachers and extension workers in lines of landscape gardening and civic improvement. (5) To give a broad and liberal general education stressing the fundamental principles of art.

The department has large, well-lighted drafting rooms, with all necessary equipment, such as planimeters, eidograph, pantograph, blue-printing outfit, etc.; and a complete outfit of surveying instruments, including transits, levels, plane tables, prismatic compasses, hand levels, etc. The college campus presents an unusually good collection of the plant materials used in landscape gardening.

*Elective Courses.*

50. **I. MAPPING AND TOPOGRAPHY.** — Juniors. Reconnaissance surveys and mapping, with special reference to the methods used in landscape gardening; detailed study of selected designs of leading landscape gardeners; grade design, road design and field work. Must be followed by Course 51.

2 2-hour laboratory periods; 2 3-hour laboratory periods, credit, 5.

Assistant Professor HARRISON.

Prerequisites, Mathematics 26 and 27, Drawing 25, 26 and 27, Horticulture 27.

51. **II. ELEMENTS OF LANDSCAPE GARDENING.** — Juniors. As stated under Course 50.

3 3-hour laboratory periods, credit, 4.

Assistant Professor HARRISON.

Prerequisite, Landscape Gardening 50.

52. **III. GENERAL DESIGN.** — Juniors. Field notes; examination of completed works and those under construction; design of architectural details, planting plans, gardens, parks and private grounds; written reports on individual problems. Must be followed by Course 53.

2 2-hour laboratory periods; 2 3-hour laboratory periods, credit, 5.

Assistant Professor HARRISON.

Prerequisites, Landscape Gardening 50 and 51, and either plant materials (Horticulture 50 and 51) or advanced mathematics.

75. **I. THEORY OF LANDSCAPE ART.** — For seniors and graduates. The general theory and applications of landscape study, including a brief history of the art.

3 class hours.

Credit, 3.

Professor WAUGH.

76. **II. CIVIC ART.** — Seniors. The principles and applications of modern civic art, including city planning, city improvement, village improvement and rural improvement, with special emphasis upon country planning. Must be followed by Course 77.

3 3-hour laboratory periods, credit, 4.

Professor WAUGH.

Prerequisite, Landscape Gardening 53.

77. **III. COUNTRY PLANNING.** — Seniors. As stated under Course 76.

3 3-hour laboratory periods, credit, 4.

Professor WAUGH.

Prerequisite, Landscape Gardening 76.

78. **III. ARCHITECTURE.** — Alternating with Course 79; given in 1918-19. Juniors and seniors. The history of architectural development, the different historic types, with special reference to the underlying principles of construction and design and their relations to landscape design. Illustrated lectures, conferences, practice in designing.

3 class hours.

Credit, 3.

Assistant Professor HARRISON.

79. **III. CONSTRUCTION AND MAINTENANCE.** — Alternating with Course 78; given in 1919-20. Juniors and seniors. Detailed instruction in methods of construction and planting in carrying out plans, in organization, reporting, accounting, estimating, etc.; maintenance work in parks and on estates, its organization, management, cost, etc.

3 class hours.

Credit, 3.

Assistant Professor HARRISON.

80. **I. THEORY OF DESIGN.** — Juniors. As stated under Course 52. [Will be given in the summer term when that is established; meantime, will be given in term I, senior year.]

120 laboratory hours, credit, 4.

Professor WAUGH.

Prerequisite, Landscape Gardening 52.

81. **II. ESTATE DESIGN.** Credit, 4.

Assistant Professor HARRISON.

82. **III. PARK DESIGN.** Credit, 4.

Assistant Professor HARRISON.

### **Pomology.**

Professor SEARS, Assistant Professor DRAIN, Mr. GOULD.

The object of the courses in pomology is to give the student a training which shall be at once thoroughly practical and yet scientific. This will fit the men to enter the field of practical fruit-growing, or it will furnish an excellent foundation for further study in case the student elects to take up research or teaching work.

The department has 50 acres in fruit plantations. The apple orchards are the most extensive, comprising about 35 acres of various ages, but there are also blocks of pears, peaches, plums and cherries. In small fruits there are plantings of strawberries, raspberries, blackberries, currants and gooseberries. There are three vineyards, with a total area of 5 acres, in which the leading varieties and the principal types of pruning and training are represented. In these plantations are 50 varieties of grapes, representing three native American species and many hybrids; 20 varieties of peaches; 20 varieties of pears; 25 of plums, including five species and many hybrids; and 100 varieties of apples.

The department has an excellent equipment of spraying and dusting machinery, including various styles and sizes of power sprayers, and many types of barrel pumps and smaller sprayers. There is also an excellent assortment of orchard tools, including plows, harrows, fertilizer sowers, etc.



Fisher Laboratory is one of the best planned and equipped packing and storage plants to be found in the United States. It includes six refrigerated rooms of various sizes; four storage rooms not refrigerated; one large laboratory room and one classroom, besides ample storage room for fruit packages and equipment. The equipment for the building itself includes four types of apple sizers; packing tables and box and barrel presses of various types, besides all kinds of packages and the smaller equipment necessary for thoroughly modern work in grading and packing fruit. The department is well equipped with lockers and with pruning and other tools for the use of students in laboratory work. Such work is made a leading feature in all the courses in pomology.

*Elective Courses.*

50. **I. PRACTICAL POMOLOGY.** — For juniors; seniors may elect. A study of the general principles of the growing of fruits, dealing with such questions as selection of site, soils, windbreaks, laying out plantations, choice of nursery stock, pruning, culture of orchards, orchard fertilizers, cropping orchards, etc. Lectures, supplemented with text and reference books; field and laboratory exercises.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor SEARS.

Prerequisite, Horticulture 27.

51. **II. PRACTICAL POMOLOGY.** — For juniors; seniors may elect. As stated under Course 50.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor SEARS.

Prerequisite, Pomology 50.

52. **III. PRACTICAL POMOLOGY.** — For juniors; seniors may elect. As stated under Course 50.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor SEARS.

Prerequisite, Pomology 51.

53. **IV. (Summer.) SMALL FRUITS.** — For juniors; seniors may elect. The growing, harvesting, marketing and storing of small fruits, including raspberries, blackberries, strawberries, currants, gooseberries and grapes, together with thinning, spraying, picking and marketing of tree fruits at the college orchards and in private commercial orchards.

120 laboratory hours, credit, 5.

The DEPARTMENT.

75. **I. SYSTEMATIC POMOLOGY.** — Seniors. A study of the varieties of the different fruits and of nomenclature, with critical descriptions; special reference being given to relationships and classification. Lectures, laboratory and field exercises.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Assistant Professor DRAIN.

Prerequisite, Pomology 52.

76. **II. SYSTEMATIC POMOLOGY.** — Seniors. As stated under Course 75.  
1 class hour. 2 2-hour laboratory periods, credit, 3.  
Assistant Professor DRAIN.

Prerequisite, Pomology 75.

77. **I. COMMERCIAL POMOLOGY.** — Seniors only, majoring in pomology. The picking, handling, storing and marketing of fruits, including a discussion of storage houses, fruit packages, methods of grading and packing. Especial emphasis is placed upon laboratory and field work, where the student is given actual practice in the picking and packing of all the principal fruits.

1 class hour. 2 2-hour laboratory periods, credit, 3.  
Mr. GOULD.

Prerequisite, Pomology 52.

78. **III. SPRAYING.** — Seniors. A study of (a) spraying materials, their composition, manufacture and preparation for use; the desirable and objectionable qualities of each material, formulas used, cost, tests of purity. (b) Spraying machinery, including all the principal types of pumps, nozzles, hose and vehicles; their structure and care. (c) Orchard methods in the application of the various materials used, with the important considerations for spraying each fruit and for combating each orchard pest. This course is designed especially to familiarize the student with the practical details of actual spraying work in the orchard. Spray materials are prepared, spraying apparatus is examined and tested, old pumps are overhauled and repaired, and the actual spraying is done in the college orchards and small-fruit plantations.

1 class hour. 2 2-hour laboratory periods, credit, 3.  
The DEPARTMENT.

Prerequisite, Pomology 52.

79. **III. GENERAL POMOLOGY.** — For seniors; juniors may elect. This course is planned to meet the needs of those students who cannot devote more than one term to the subject but who want a general knowledge of fruit growing. The work will consist of lectures and laboratory exercises on such topics as choosing the locations, kinds and varieties of fruits to grow, securing and setting the plants, care and cultivation, pruning, spraying, pests, harvesting and storing.

2 class hours. 1 2-hour laboratory period, credit, 3.  
The DEPARTMENT.

80. **I. SEMINAR.** — For seniors majoring in pomology. Advanced study of problems relating to the business of fruit growing. Each student will be assigned a major and a minor problem in lines of work in which he is particularly interested. He will pursue his studies both by reading and research, and the materials obtained will be worked into theses which will be presented to the seminar for discussion. Reports on minor problems will be taken up first. No lectures will be given, but seminar meetings will be held for one period each week.

Credit, 1.  
Professor SEARS.

81. **II. SEMINAR.** — For seniors majoring in pomology. A continuation of Course 80. One seminar meeting each week.

Credit, 1.  
Professor SEARS.

82. **III. SEMINAR.** — For seniors majoring in pomology. A continuation of Course 81. One seminar meeting each week.

Credit, 1.  
Professor SEARS.

### **Vegetable Gardening.**

Professor TOMPSON, Professor DACY, Mr. HARRIS.

Course 50 is offered for students who desire a general view of the subject, which may be secured in one term. The other courses cover very thoroughly the principles and practices of the commercial production of vegetables in the open, and the forcing of vegetables in cold frames, hotbeds and greenhouses. They are designed for students who wish to engage in the business for themselves or for others, or who wish to become teachers or investigators in the more technical phases of the subject.

The department has 12 acres of land, greenhouses, hotbeds and cold frames, with modern equipment devoted to the production of a wide variety of crops. These afford excellent subject-matter for study, and opportunity for close contact with the actual problems of the business.

#### *Elective Courses.*

50. **I. GENERAL VEGETABLE GARDENING.** — Juniors; seniors may elect. A general course for students not specializing in vegetable gardening. Designed to teach the fundamentals of vegetable gardening. Soils, fertilizers, garden crops, general methods of management. [Offered for first time in 1919-20.]

2 class hours.

1 2-hour laboratory period, credit, 3.  
Professor DACY.

51. **I. PRACTICAL VEGETABLE GARDENING.** — Juniors; seniors may elect. A study of the principles of vegetable gardening. Deals with such questions as the selection of a location; soils, manures and fertilizers, green manure and cover crops; seeds and seeding; the construction and management of hotbeds and cold frames; garden planning, planting, tillage, irrigation; control of insects and diseases; harvesting, marketing and storing. Includes a detailed study of the cultural requirements of the common vegetable crops, and the principles of rotation and double cropping. Text and reference books. Laboratory and field exercises.

2 class hours.

1 2-hour laboratory period, credit, 3.  
Professor DACY.

Prerequisite, Horticulture 27.

52. **II. PRACTICAL VEGETABLE GARDENING.** — Juniors; seniors may elect. As stated under Course 51.

2 class hours.

1 2-hour laboratory period, credit, 3.  
Professor DACY.

Prerequisite, Vegetable Gardening 51.

53. **III. PRACTICAL VEGETABLE GARDENING.** — Juniors; seniors may elect. As stated under Course 51.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor DACY.

Prerequisite, Vegetable Gardening 52.

54. **IV. VEGETABLE GARDENING PRACTICE.** — Field work in summer term after junior year. The work of this course will be under the direct supervision of an instructor, and will give the student an unusual opportunity to learn, at first hand, the methods and problems of commercial vegetable growing. Most of the work will be in the field devoted to seed planting, cultural practices, harvesting and preparing for market. Required of those majoring in vegetable gardening.

120 laboratory hours, credit, 5.

Prerequisite, Vegetable Gardening 53.

75. **I. SYSTEMATIC VEGETABLE GARDENING.** — Seniors. This course will include the systematic study of varieties, types and strains of the leading vegetable crops; the establishing of types, determination of quality of varieties; seed growing, variety improvement, roguing, seed harvesting, curing and storing.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Professor DACY.

Prerequisite, Vegetable Gardening 54.

76. **II. GREENHOUSE CONSTRUCTION AND VEGETABLE FORCING.** — Seniors. A study of types, materials, construction, location, arrangement, capacity and cost of greenhouses for growing vegetables. A brief consideration of the heating plant, — the type, installation, piping and management; also the study of greenhouse vegetable crops and their production as practiced by commercial growers.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Professor DACY.

Prerequisite, Vegetable Gardening 75.

77. **III. COMMERCIAL VEGETABLE GROWING.** — Seniors. A consideration of vegetable growing as a business. A study of this specialized type of farming, including places where developed, types, extent, economic importance, capitalization, equipment and other fundamental problems of commercial vegetable gardening. Students will assist in the planning and operation of a typical market-gardening area. Visits will be made to market-gardening and truck-gardening farms.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Professor DACY.

Prerequisite, Vegetable Gardening 76.

78. **I. SEMINAR.** — For seniors majoring in vegetable gardening. Each student will be assigned problems relating to the business of vegetable gardening. Reports on the work on these problems will be made each week to the seminar, and the results presented as a thesis.

Credit, 1.

Professors TOMPSON and DACY.

79. **II. SEMINAR.** — For seniors majoring in vegetable gardening. A continuation of Course 78. One seminar meeting each week.

Credit, 1.

Professors TOMPSON and DACY.

80. **III. SEMINAR.** — For seniors majoring in vegetable gardening. A continuation of Course 79. One seminar meeting each week.

Credit, 1.

Professors TOMPSON and DACY.

### **Drawing.**

#### *Elective Courses.*

25.<sup>1</sup> **I. FREE-HAND DRAWING.** — For sophomores; juniors and seniors may elect. Lettering; free-hand perspective; sketching from type models, leaves, flowers and trees, houses, etc.; laying flat and graded washes in water colors; water-color rendering of leaves, flowers and trees; conventional coloring and map rendering in water colors; conventional signs and mapping in ink.

3 2-hour laboratory periods, credit, 3.

26.<sup>1</sup> **II. MECHANICAL DRAWING.** — For sophomores; juniors and seniors may elect. Inking exercises; geometric problems; projection; intersections; isometric; shades and shadows; parallel; angular and oblique perspective; perspective drawing of buildings. Students should have preparation in plane and solid geometry.

3 2-hour laboratory periods, credit, 3.

27.<sup>1</sup> **III. MECHANICAL DRAWING.** — For sophomores; juniors and seniors may elect. As stated under Course 26.

3 2-hour laboratory periods, credit, 3.

Prerequisite, Drawing 26.

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<sup>1</sup> Given by Assistant Professor Harrison.

**DIVISION OF SCIENCE.**

Professor FERNALD.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

**Botany.**

Professor OSMUN, Professor ANDERSON, Assistant Professor CLARK, Assistant Professor McLAUGHLIN, Dr. TORREY.

A knowledge of the principles of plant life is fundamental in agricultural education. The required courses in botany are planned with this and the general educational value of the subject in view. Elective courses are of two types: (1) those which have for their chief aim the direct support of technical courses in agriculture and horticulture, and (2) those providing broader, more intensive training in the science. Courses in the second group may lead, when followed by postgraduate study, to specialization in the field. They also furnish excellent training for those specializing in other sciences and in scientific agriculture. In all undergraduate courses the relation of the science of botany to agriculture is emphasized.

The department occupies Clark Hall, a brick building 55 by 95 feet, two stories high, with basement and attic. The building has two lecture rooms with seating capacity of 154 and 72, respectively; one seminar and herbarium room; large laboratories for general and special work; and smaller rooms for advanced students. A glass-enclosed laboratory for plant physiology adjoins the main building and provides unusual facilities for the study of phenomena of plant life. In addition, a greenhouse 28 by 70 feet is connected with the building. This is for experimental work in plant pathology and physiology, and for growing plants needed for instruction. The experiment station laboratories devoted to botanical research are in this building.

The laboratories and lecture rooms are of modern construction, finely lighted, and equipped with compound and dissecting microscopes, microtomes, paraffin and drying ovens, physiological and other apparatus, and a large collection of charts. The herbarium contains about 20,000 sheets of seed plants and ferns, 1,200 sheets of liverworts and mosses, and 25,000 specimens of fungi. Facilities and equipment for the study of plant physiology and pathology are excelled in few other institutions.

*Required Courses.*

3. **III. INTRODUCTORY BOTANY.** — Freshmen. This course presents the seed plants as plastic organisms molded by their environment. It also introduces the student to methods of identifying and classifying plants.

An herbarium, illustrative of systematic, ecological and economic features, is started in the spring, but need not be presented until fall when credit is given in Course 25. This makes it possible for the interested student to familiarize himself with the flora of the full growing season.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Dr. TORREY and Assistant Professor McLAUGHLIN.

25. **I. INTRODUCTORY BOTANY.** — Sophomores. The anatomy and physiology of the seed plants (Phanerogamia), with a brief summary of the lower forms of plant life. The herbarium started in connection with Botany 3 is presented as part of this course.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Dr. TORREY.

Prerequisite, Botany 3.

*Elective Courses.*

26. **II. MORPHOLOGY AND TAXONOMY OF THE LOWER PLANTS (CRYPTOGAMIA).** — Sophomores. Systematic study of typical forms of bacteria, algæ, fungi, lichens, mosses, ferns. (Courses 3, 25 and 26 constitute a general elementary course in botany, and are required of all students who major in the subject.)

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professor OSMUN and Dr. TORREY.

Prerequisite, Botany 25.

27. **III. THE VASCULAR PLANTS.** — For sophomores; juniors and seniors may elect. This course continues the work of Botany 26, but deals with the higher plants, such as ferns and fernworts, gymnosperms and angiosperms. The department possesses a unique collection of lantern slides and microscopical preparations for use in this course.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Dr. TORREY.

Prerequisite, Botany 26.

50. **I. DISEASES OF CROPS.** — For juniors; seniors may elect. The lectures are general and are taken by all who elect the course, but in order to permit students to specialize on the diseases of crops most closely related to their majors or in which they are most interested, the course is divided for laboratory work into the following sections: (I) diseases of truck and field crops; (II) diseases of floricultural crops and ornamentals; (III) diseases of fruit crops; (IV) diseases of shade and forest trees. One, two or three laboratory sections may be taken.

1 class hour.

1, 2 or 3 2-hour laboratory periods, credits, 2, 3 or 4.

Assistant Professor McLAUGHLIN.

Prerequisites, Botany 3 and 25.

51. **II. DISEASES OF CROPS.** — For juniors; seniors may elect. As stated under Course 50.

1 class hour.

1, 2 or 3 2-hour laboratory periods, credits, 2, 3 or 4.

Assistant Professor McLAUGHLIN.

Prerequisite, Botany 50.

52. **I. SYSTEMATIC MYCOLOGY.** — For juniors; seniors may elect. Morphology and development of typical species representing the orders and families of fungi; practice in identification, collection and preservation of fungi; study

of systems of classification; collateral reading. A prerequisite of the senior course in plant pathology, but open to all.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professor ANDERSON.

Prerequisite, Botany 26.

53. **II. SYSTEMATIC MYCOLOGY.** — For juniors; seniors may elect. As stated under Course 52.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professor ANDERSON.

Prerequisite, Botany 52.

54. **III. SYSTEMATIC MYCOLOGY.** — For juniors; seniors may elect. As stated under Course 52.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professor ANDERSON.

Prerequisite, Botany 53.

55. **I. PLANT HISTOLOGY.** — For juniors; seniors may elect. Comparative study of the tissues of plants; training in histological methods, including the use of precision microtomes, methods of killing, fixing, sectioning, staining and mounting; collateral reading and conferences. This course offers valuable training in preparation for further work in botany.

3 2-hour laboratory periods, credit, 3.

Professor OSMUN and Assistant Professor McLAUGHLIN.

Prerequisites, Botany 3 and 25.

56. **II. PLANT HISTOLOGY.** — For juniors; seniors may elect. As stated under Course 55.

3 2-hour laboratory periods, credit, 3.

Professor OSMUN and Assistant Professor McLAUGHLIN.

Prerequisite, Botany 55.

75. **I. PLANT PATHOLOGY.** — Seniors. Comprehensive study of diseases of plants; training in laboratory methods and technique, including culture work and artificial inoculation of hosts; miscellaneous diagnosis; study of literature and representative life histories of pathogens. Prepares for civil service, experiment station and college work.

1 class hour.

4 2-hour laboratory periods, credit, 5.

Professors OSMUN and ANDERSON.

Prerequisite, Botany 54.

76. **II. PLANT PATHOLOGY.** — Seniors. As stated under Course 75.

1 class hour.

4 2-hour laboratory periods, credit, 5.

Professors OSMUN and ANDERSON.

Prerequisite, Botany 75.



77. **III. PLANT PATHOLOGY.** — Seniors. As stated under Course 75.  
1 class hour. 4 2-hour laboratory periods, credit, 5.  
Professors OSMUN and ANDERSON.

Prerequisite, Botany 76.

78. **I. PLANT PHYSIOLOGY.** — Seniors. Study of the factors and conditions of (a) Plant Nutrition, including the taking up of water and mineral substances, the assimilation of carbon and nitrogen, and the release of energy due to the processes of dissimilation; (b) Plant Growth, including the influence of internal and external factors on growth, the development of reproductive and vegetative organs, and touching on plant inheritance and the origin of new varieties; (c) Plant Movements, including those due to the taking up of water, and those movements of both motile and fixed forms in response to external stimuli. Special emphasis is laid on the development of skill in the manipulation of apparatus in the laboratory; weekly conferences are held at which students report on assignments to a large range of original papers.

2 class hours. 3 2-hour laboratory periods, credit, 5.  
Assistant Professor CLARK.

Prerequisites, Botany 26 and Chemistry 51.

79. **II. PLANT PHYSIOLOGY.** — Seniors. As stated under Course 78.  
2 class hours. 3 2-hour laboratory periods, credit, 5.  
Assistant Professor CLARK.

Prerequisite, Botany 78.

80. **III. PLANT PHYSIOLOGY.** — Seniors. As stated under Course 78.  
2 class hours. 3 2-hour laboratory periods, credit, 5.  
Assistant Professor CLARK.

Prerequisite, Botany 79.

82. **II. CYTOLOGY AND EMBRYOLOGY.** — Seniors. Morphology and physiology of the cell; cell-division; embryonal development.

3 2-hour laboratory periods, credit, 3.  
Assistant Professor McLAUGHLIN.

Prerequisites, Botany 26 and 55.

83. **III. CYTOLOGY AND EMBRYOLOGY.** — Seniors. As stated under Course 82.

3 2-hour laboratory periods, credit, 3.  
Assistant Professor McLAUGHLIN.

Prerequisite, Botany 82.

86. **I.** 87. **II.** 88. **III. SEMINAR.** — For seniors and graduate students. Presentation and discussion of important current botanical papers. A major requirement.

1 class hour.

Credit, 1.  
The DEPARTMENT.

### General and Agricultural Chemistry.

Professor LINDSEY, Professor WELLINGTON, Professor CHAMBERLAIN, Professor PETERS,  
Professor ———, Assistant Professor SEREX.

In teaching the courses in chemistry, emphasis is laid on both their educational and their vocational value. The courses in the freshman year are intended to deal with fundamental principles, and to give the student such an understanding of the subject as will enable him to apply it in farm practice. The more advanced courses, including quantitative analysis and organic, physiological and physical chemistry, are intended primarily for those who intend to become teachers and workers in the allied sciences, or who desire to follow agricultural chemistry as a vocation. Advanced training is given by means of postgraduate courses (see Graduate School).

Those completing the undergraduate courses are fitted for positions in the agricultural industries, — fertilizer, feed and insecticide manufacture, — as well as in other lines of industry, and in the State experiment stations and in commercial laboratories. Postgraduate students are prepared for positions as teachers in high schools and colleges, and for more advanced positions in industry and in the experiment stations. All men who were worthy of recommendation have secured positions.

An entire building is devoted to the needs of the department. The basement is used for the storage of apparatus and chemicals. The first floor contains laboratories for organic, physiological and physical chemistry, and qualitative analysis. The second floor is occupied by the general lecture room, the reading room, offices for the several members of the staff, and laboratories for analytical chemistry. The third floor has desk room and hoods sufficient to accommodate 90 students at one time in general chemistry. On this floor is also a lecture room seating 56 students.

The entire laboratory is well equipped with the necessary apparatus and chemicals for all students who desire to perfect themselves as expert chemists, or who wish to study chemistry as a supplement to some other kind of practical or scientific work. The equipment includes a valuable and growing collection of specimens and samples of minerals, soils, raw and manufactured fertilizers, foods, milk products, fibers, various other vegetable and animal products, and artificial preparations of mineral and organic compounds; and also a series of preparations for illustrating the various stages of different manufactures from raw material to finished product.

#### *Required Courses.*

1. **I. GENERAL CHEMISTRY.** — Freshmen. An introduction to the fundamental chemical laws, together with a study of the common acid-forming elements and their compounds. Textbook, Kahlenberg's "Outlines of Chemistry." This course is for those students who do not present chemistry for entrance, and who begin the subject in college.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor PETERS and Assistant Professor SEREX.

2. **II. GENERAL CHEMISTRY.** — Freshmen. A continuation of Course 1. A study of metals and their compounds. The laboratory work is the same as described under Course 4.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor PETERS.

3. **III. INORGANIC AGRICULTURAL CHEMISTRY.** — Freshmen. As stated under Course 5, **II.**

2 class hours.

1 2-hour laboratory period, credit, 3.

Assistant Professor SEREX.

4. **I. ADVANCED GENERAL CHEMISTRY.** — Freshmen. A review of the fundamental chemical laws, together with the common acid and base-forming elements and their compounds. Textbook, Kahlenberg's "Outlines of Chemistry." The laboratory work takes the synthetic form. Substances of agricultural importance are prepared in quantity and studied in detail by the student. These include ammonium sulfate, superphosphate, muriate and sulfate of potash, arsenate of lead, Paris green, Bordeaux mixture, lime-sulfur and emulsions.

2 class hours.

1 2-hour laboratory period, credit, 3.

Assistant Professor SEREX.

Prerequisite, Entrance Chemistry.

5. **II. INORGANIC AGRICULTURAL CHEMISTRY.** — Freshmen. A study of the chemical composition, properties and reactions of soils, fertilizers, fungicides and insecticides. The laboratory work is divided into three parts, as follows: (a) qualitative examination of soil, plant ash and superphosphate; (b) approximate quantitative determination of moisture, ash, carbonic acid, phosphoric acid, potash, etc.; (c) special work on retention of salts by soil, leaching of lime from the soil by carbonated water, etc.

2 class hours.

1 2-hour laboratory period, credit, 3.

Assistant Professor SEREX.

6. **III. ORGANIC AGRICULTURAL CHEMISTRY.** — Freshmen. The course embraces the study of the most important groups of organic compounds of plants and animals, the composition of plants, the chemistry of plant growth, plants as food and as industrial material, the composition of animals, the chemistry of digestion, also the study of some of the products related to plants and animals, such as milk, butter, cheese, sugar and alcohol. The treatment of the subject will be general, avoiding (so far as possible) complicated chemical facts and relationships, and endeavoring simply to make the student acquainted with the general chemistry of plants and animals and agricultural processes and products.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor CHAMBERLAIN.

#### *Elective Courses.*

25. **I. QUALITATIVE ANALYSIS.** — *Basic.* — Sophomores. A course in the systematic analysis of metallic salts, presented from the ionic viewpoint. The student studies closely the tests used in the separation and identification of the metals; he then applies these tests to unknown mixtures. Text, Medicus' "Qualitative Analysis," with Stieglitz's "Qualitative Analysis" and Gooch & Browning's "Qualitative Analysis" for reference. This course should be taken, particularly, by all intending to follow chemistry as a vocation.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Assistant Professor SEREX.

Prerequisite, Chemistry 3 or 6.

26. **II. QUALITATIVE ANALYSIS.** — *Acidic.* — Sophomores. A continuation of Course 25.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Assistant Professor SEREX.

27. **III. QUANTITATIVE ANALYSIS.** — For sophomores; juniors and seniors may elect. Instruction in this course includes the gravimetric and volumetric determinations of some of the commoner metals and non-metals. Talbot's "Quantitative Chemical Analysis" is used as a text.

1 class hour.

2 4-hour laboratory periods, credit, 5.

Professors WELLINGTON and PETERS.

Prerequisite, Chemistry 25. Course 26 is prerequisite for those majoring in chemistry.

30. **III. ORGANIC AGRICULTURAL CHEMISTRY.** — For sophomores; juniors and seniors may elect. As described in Course 6. To be elected by those who have not had Chemistry 6.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Professor CHAMBERLAIN.

51. **I. ORGANIC CHEMISTRY.** — For juniors; seniors may elect. This course consists of a systematic study, both from texts and in the laboratory, of the more important compounds in the entire field of organic chemistry. Especial attention is given to those compounds which are found in agricultural products or are manufactured from them. These include alcohols, acids, esters, fats, carbohydrates and proteins. The work forms a foundation for courses in physiological chemistry and agricultural analysis, and is especially planned for those majoring in chemistry or the other sciences. Those electing Course 51 are expected to elect Course 52.

5 class hours.

2 3-hour laboratory periods, credit, 8.

Professor CHAMBERLAIN.

Prerequisites, Chemistry 3 or 6, and Chemistry 27 for those majoring in chemistry.

52. **II. ORGANIC CHEMISTRY.** — For juniors; seniors may elect. A continuation of Course 51, dealing principally with compounds of the benzene series.

5 class hours.

2 3-hour laboratory periods, credit, 8.

Professor CHAMBERLAIN.

62. **III. ADVANCED QUANTITATIVE ANALYSIS.** — For juniors; seniors may elect. Advanced work on subjects as stated under Course 27, together with the analysis of insecticides or the analysis of soils and fertilizers.

1 class hour.

2 4-hour laboratory periods, credit, 5.

Professors WELLINGTON and PETERS.

Prerequisite, Chemistry 27.

65. **III. PHYSICAL CHEMISTRY.** — For juniors; seniors may elect. A résumé of general chemistry from the viewpoint of physical chemistry, and the application of physical chemistry to agricultural chemistry.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Assistant Professor SEREX.

Prerequisite, Chemistry 27.

76. **I. MILK AND BUTTER ANALYSIS.** — For seniors; juniors may elect. A study of milk and butter analytically.

1 class hour.

2 4-hour laboratory periods, credit, 5.

Professor PETERS and Assistant Professor JULIAN.

Prerequisite, Chemistry 27.

77. **II. CATTLE FEED, WATER AND MISCELLANEOUS ANALYSIS.** — For seniors; juniors may elect. The analysis of cattle feeds and water, with interpretations. Other materials may be analyzed.

1 class hour.

2 4-hour laboratory periods, credit, 5.

Professor PETERS and Assistant Professor JULIAN.

Prerequisite, Chemistry 27.

80. **I. PHYSIOLOGICAL CHEMISTRY.** — Seniors. This course is intended to be supplementary to Courses 51 and 52. To those who expect to take up scientific work in microbiology, botany, agronomy, animal husbandry, etc., and who have had Courses 51 and 52, it will give acquaintance with the chemistry of the physiological processes in plants and animals, by means of which some of the important organic compounds studied in Courses 51 and 52 are built up in the living organism or are used as food by it. In the lectures the study of food and nutrition as related to both human and domestic animals is the principal subject. In the laboratory experimental studies are made of the animal body and the processes and products of digestion, secretion and excretion.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Professor CHAMBERLAIN.

87. **III. HISTORY OF CHEMISTRY.** — Seniors. An exposition of the development of chemical knowledge from the earliest times to the present. Although the entire history will be included, the larger portion of it will receive only brief mention in order that the questions of vital interest in modern life and industry may be studied at greater length. Particular attention will be given to the questions of plant and animal industry. Chemists are strongly advised to take this course.

3 class hours.

Credit, 3.

Professor WELLINGTON.

90. **II. SPECIAL WORK IN AGRICULTURAL CHEMICAL ANALYSIS.** — Seniors. The student is given a problem to solve either in analytical chemistry or related to the agricultural industries. This is to acquaint him with the methods used in research and with the literature, and show him how to handle problems in this field of chemistry when occasion arises.

6 or 10 laboratory hours, credit, 3 or 5.

Professor PETERS.

91. **III. SPECIAL WORK IN AGRICULTURAL CHEMICAL ANALYSIS.** — Seniors. As stated in Course 90.

10 laboratory hours, credit, 5.

Professor PETERS.

Prerequisite, Chemistry 90.

92. **II. SPECIAL WORK IN PHYSIOLOGICAL AND ORGANIC AGRICULTURAL CHEMISTRY.** — Seniors. In this course, as in Courses 90 to 95, the student will be able to give his attention primarily to one line of chemical study. To those whose tastes and interests are in connection with the organic and physiological problems of agricultural chemistry, many subjects of study present themselves, among which may be mentioned: proteins, carbohydrates, fats, organic nitrogenous compounds in fertilizers and soils and their relation to plants, the commercial production of alcohol from agricultural products, dyes, digestion and dietary studies, the chemical study of dairy products, etc.

6 or 10 laboratory hours, credit, 3 or 5.

Professor CHAMBERLAIN.

Prerequisites, Chemistry 51, 52 and 80.

93. **III. SPECIAL WORK IN PHYSIOLOGICAL AND ORGANIC AGRICULTURAL CHEMISTRY.** — Seniors. As stated under Course 92.

10 laboratory hours, credit, 5.

Professor CHAMBERLAIN.

Prerequisite, Chemistry 92.

94. **II. SPECIAL WORK IN PHYSICAL CHEMISTRY.** — Seniors. The field of agricultural chemistry offers many problems that have been attacked through the methods of physical chemistry; such, for example, are the hydrolysis of salts and of minerals and the absorption of salts and fertilizers by soils. Each student will select one line of work and follow it through the course, repeating some of the original work.

6 or 10 laboratory hours, credit, 3 or 5.

Assistant Professor SEREX.

Prerequisite, Chemistry 65.

95. **III. SPECIAL WORK IN PHYSICAL CHEMISTRY.** — Seniors. As stated under Course 94.

10 laboratory hours, credit, 5.

Assistant Professor SEREX.

Prerequisite, Chemistry 94.

### **Entomology.**

Professor FERNALD, Professor CRAMPTON, Assistant Professor REGAN.

The introductory Courses 26 and 27, taken together, present a comprehensive view of the relation of insects to man, particularly as crop pests. The most important pests are carefully studied, together with the methods for their control. Courses 50 and 51 are arranged for special study of the pests of any one line of agricultural or horticultural occupation, selected by the student according to his plan of future work, with the intent of making him thoroughly familiar with the pests he will meet in his selected work after graduation, and the means of controlling them. The remaining courses are for the training of men as State or experiment station entomologists; for those going into the care of trees, etc., on estates, or for cities and towns; and as entomological experts, for which the demand has been very large.

A recently erected building provides excellent lecture rooms and laboratories. The laboratories are provided with individual desks, equipped with microscopes and all needed apparatus of all kinds. Dissecting microscopes,

binoculars, microtomes, photographic apparatus, glassware and reagents are available for use and electric light and gas are connected with each desk. Two laboratories, one for juniors and seniors, the other for graduate students, are thus equipped. A department library containing all the more important works on insects, supplemented by others on the subject in the main library, and by the private libraries of the professors, make available more than 25,000 books and pamphlets on this subject. In addition, all the current magazines are received and their files are accessible to every one. A card catalogue giving references to the published articles on different insects contains about 65,000 cards, and is probably the largest index of its kind in the world. Spray pumps, nozzles and spraying appliances of all kinds are in use in various parts of the courses, and a large collection of insecticides is accessible for study. Photographic rooms are specially prepared for the photography of insects, and the greenhouses, gardens, orchards and the grounds of the college provide wide opportunities for the study, under natural conditions, of insect pests.

*Elective Courses.*

26. **II. 27. III.** GENERAL AND ECONOMIC ENTOMOLOGY. — For sophomores; juniors and seniors may elect. This course is planned to meet the needs of students who desire some knowledge of insects, but who cannot give more than two terms to the subject. It also serves as an introduction to the later courses for those who intend to follow entomology farther. It touches briefly upon the structure of insects so far as this is needed for such a course; deals with metamorphosis, classification to the larger groups, and discusses the most important methods and materials used for control. The greater part of the time is devoted to special study of the most important insect pests, particularly of New England, showing their modes of life, the injuries they cause, and the best methods of control. In this way the most serious pests of fruit trees, ornamental trees and shrubs, market-garden and greenhouse pests, those attacking field crops and those affecting animals and man, are treated. During the winter term and in the spring term until about the first of May instruction is given by lectures and recitations; from about the first of May field work takes the place of the lectures. In this part of the course the students are shown how to find and recognize the work of the various insect pests which may be accessible at that season of the year, and they also make and preserve a collection of insects.

3 class hours.

Credit, 3.

Professor FERNALD.

27. **III.** GENERAL AND ECONOMIC ENTOMOLOGY. — As stated under Course 26, **II.**

2 class hours till about May 1; thereafter 2 2-hour field periods. Credit, 2.

Professors FERNALD, CRAMPTON and REGAN.

50. **I.** PESTS OF SPECIAL CROPS. — For juniors; seniors may elect. For students not majoring in entomology, and also for those majoring in entomology. The laboratory work is largely individual in this term. Accordingly, students majoring in subjects other than entomology, but who desire a more complete knowledge of the insects connected with their own major line of work, can obtain it here. A student majoring in floriculture, for example,

will devote his laboratory time to a careful study of the insects injuring floral crops, learning how to recognize them and their work in their different stages, and the best methods for their control. Courses of this kind are available on the insects attacking field crops, market-garden crops, tree fruits, small fruits, shade trees and shrubs, flowers, forest trees, the domesticated animals, household pests and man. This work may be continued in the winter term also. (See 51, **II.**)

3 2-hour laboratory periods, credit, 3.

Professor FERNALD.

Prerequisites, Entomology 26 and 27.

51. **II. PESTS OF SPECIAL CROPS.** — As stated in 50, **I.** For students not majoring in entomology. Those who were not able to take Entomology 50 in the fall may take it here. Those who took Entomology 50 in the fall have an opportunity to continue the work during this term also.

3 2-hour laboratory periods, credit, 3.

Professor FERNALD.

52. **II. INSECTICIDES AND THEIR APPLICATION. CLASSIFICATION OF INSECTS.** — For juniors majoring in entomology. Lectures on the composition, preparation and methods of application of insecticides. Laboratory work on classification of insects, particularly those for which insecticides are used.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professors FERNALD and REGAN.

Prerequisite, Entomology 53.

53. **I. INSECT MORPHOLOGY.** — For juniors majoring in entomology. The lectures of this course treat of the external and internal anatomy of insects, particularly of those characters used in identification, a knowledge of which is needed in the accompanying laboratory work. In the laboratory the external anatomy of the most important groups is studied, followed by the identification of insects of these groups, to show how the characters are made use of in learning the names of insects, and to teach the use of analytical keys. 2 class hours.

3 2-hour laboratory periods, credit, 5.

Professor CRAMPTON.

Prerequisites, Entomology 26 and 27.

54. **II. INSECT CLASSIFICATION.** — For juniors majoring in entomology. Systematic identification of insects of various groups. Study of various entomological publications and methods of finding the literature on any insect.

3 2-hour laboratory periods, credit, 3.

Assistant Professor REGAN.

Prerequisite, Entomology 53.

55. **III. ECONOMIC ENTOMOLOGY.** — For juniors majoring in entomology. Continuation of lectures on insecticides; laboratory work on the identification of insect pests, both as adults and in their early stages.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professors FERNALD, CRAMPTON and REGAN.

Prerequisites, Entomology 52 and 53.



75. **III. FOREST AND SHADE-TREE INSECTS.** — For juniors; seniors may elect. The lecture work deals with the principles and methods of controlling insects which attack forests and forest products, shade trees, etc. The laboratory periods are devoted to a study of the more important species, their identification, biology and specific control measures. Field work will supplement laboratory study if time permits.

1 class hour.

3 2-hour laboratory or field periods, credit, 4.

Assistant Professor REGAN.

Prerequisites, Entomology 26 and 27; 53 and 54 desirable.

76. **I. ADVANCED ENTOMOLOGY.** — For seniors. Studies on insect bio-nomics; scale insects, their structure, habits, methods of mounting, identification, etc.; studies of the animals not insects with which entomologists are expected to deal.

2 class hours.

3 2-hour laboratory periods, credit, 5.

Professors CRAMPTON and REGAN.

Prerequisite, Entomology 55.

77. **II. ADVANCED ENTOMOLOGY.** — Studies of the life history, habits and methods of control of the important insect pests of the United States; recognition tests of these pests and an examination of the literature on them; methods of bulletin preparation.

3 2-hour laboratory periods, credit, 3.

Assistant Professor REGAN.

Prerequisite, Entomology 76.

78. **III. ADVANCED ENTOMOLOGY.** — Insects as disease carriers; classification of the minor orders of insects; principles of classification, the use of literature on entomology and the preparation of bibliographies and indices; the enemies of insects.

1 class hour.

3 2-hour laboratory or field periods, credit, 4.

Professors FERNALD, CRAMPTON and REGAN.

Prerequisite, Entomology 77.

90. **II. EVOLUTION.** — For juniors; seniors may elect. In order to demonstrate the universal scope and operation of the laws of evolution, the course includes a brief sketch of the probable origin and evolution of matter as viewed in the light of modern physical and chemical research; the evolution of the solar system, leading to the formation of the earth; the changes in the earth, preparatory to the production of life; the physical and chemical basis of life; the probable steps in the formation of living matter, and the theories concerning it; the evolution of living things; the developmental history of man, and of the races of mankind, the evolution of human intelligence, languages, culture, institutions, etc., and man's probable future in the light of his past development. Especial consideration is given to the factors of evolution, the basic principles of heredity, sex-determination, variation and similar topics, with particular reference to their application to human welfare; and the recent contributions in the field of entomology to the advancement of our knowledge of these fundamental principles are briefly reviewed.

3 class hours.

Credit, 3.

Professor CRAMPTON.

### Mathematics and Civil Engineering.

Professor OSTRANDER, Professor MACHMER, Assistant Professor MOORE, Mr. CLARK.

The work of the freshman year is required. It is intended to furnish the necessary drill and groundwork needed for many of the scientific and practical courses of other departments. Thoroughness and accuracy are insisted upon. The advanced work in mathematics is taught from a practical standpoint, and many of its applications to other subjects are given. The courses in surveying and civil engineering are given to furnish the groundwork for a professional career. Special emphasis is given to the subjects bearing on highway construction and maintenance.

For drawing, a room on the north side is used for the draughting. It has draughting tables, T squares, scales, etc., for twenty students. Vernier protractors, parallel rules and steel T squares are available for precise work. A small room is devoted to blue printing.

In surveying, the department has a considerable number of chains and tapes, two railroad compasses, a builder's level, two dumpy levels, two Y levels and two old levels used for teaching the adjustments. Six transits are available for student use. Two are provided with solar attachments. An omnimeter with vernier reading to ten seconds is available for geodetic work. A hand level, mining aneroid barometer, and prismatic compass are provided for reconnaissance work. A set of Gilmore's needles and a Fairbanks' machine are used for cement testing.

#### *Required Courses.*

1. **I. HIGHER ALGEBRA.** — Freshmen. A brief review of radicals, quadratic equations, ratio and proportion, and progressions; graphs, binomial theorem, undetermined coefficients, summation of series, variation, continued fractions, determinants, permutations and combinations, logarithms, theory of equations. Reitz and Crathorne's "College Algebra."

5 class hours.

Credit, 5.

The DEPARTMENT.

2. **II. HIGHER ALGEBRA.** — As stated under Course 1.

2 class hours.

Credit, 2.

The DEPARTMENT.

3. **III. SOLID GEOMETRY.** — Freshmen. Theorems and exercises on the properties of straight lines and planes, dihedral and polyhedral angles, prisms, pyramids and regular solids; cylinders, cones and spheres; spherical triangles and the measurement of surfaces and solids. Wentworth and Smith's "Solid Geometry." Required unless accepted for admission.

3 class hours.

Credit, 3.

The DEPARTMENT.

5. **II. PLANE TRIGONOMETRY** (in charge of Department of Physics). — Freshmen. The trigonometric functions as lines and ratios; proofs of the principal formulas, transformations; inverse functions, use of logarithms;

the applications to the solution of right and oblique triangles; practical applications. Bowser's "Elements of Plane and Spherical Trigonometry."

3 class hours.

Credit, 3.

Professors HASBROUCK and HARRINGTON.

6. **III. MENSURATION AND COMPUTATION.** — Freshmen. The course includes a review of methods of computation, with special emphasis on short and abbreviated processes, together with methods of checking computations and of forming close approximations; use of slide rule. Also the graph, mensuration of plane and solid figures, weights and measures and elementary mechanism. Numerous practical problems are selected from such subjects as the following: the mathematics of woodworking; rough lumber; general construction; forestry methods in heights of trees; pulleys, belts and speeds; power and its transmission; dairying; agronomy; computation of areas from simple measurements.

2 class hours.

Credit, 2.

The DEPARTMENT.

*Elective Courses.*

26. **II. PLANE SURVEYING.** — For sophomores; juniors and seniors may elect. The elements of the subject, including the adjustment and use of the usual instruments. Textbook and lectures.

2 class hours.

Credit, 2.

The DEPARTMENT.

27. **III. PLANE SURVEYING.** — For sophomores; juniors and seniors may elect. As stated under Course 26. Includes field work.

3 2-hour laboratory periods, credit, 3.

The DEPARTMENT.

Prerequisite, Mathematics 26.

50. **I. ANALYTIC GEOMETRY.** — For juniors; seniors may elect. A discussion of the geometry of the line, the circle, conic sections, and the higher plane curves. Fine and Thompson's "Co-ordinate Geometry."

3 class hours.

Credit, 3.

The DEPARTMENT.

Prerequisites, Mathematics 1, 2, 3 and 5.

51. **II. DIFFERENTIAL AND INTEGRAL CALCULUS.** — For juniors; seniors may elect. A first course in the subject, with some of the more important applications. Granville's "Differential and Integral Calculus."

5 class hours.

Credit, 5.

The DEPARTMENT.

Prerequisites, Mathematics 1, 2, 3 and 5.

52. **III. INTEGRAL CALCULUS.** — For juniors; seniors may elect. A continuation of Course 51.

5 class hours.

Credit, 5.

The DEPARTMENT.

Prerequisite, Mathematics 51.

53. **II. ELEMENTARY STRUCTURES.** — For juniors; seniors may elect. An elementary course in roofs and bridges. Textbook and lectures.  
3 class hours. 1 2-hour laboratory period, credit, 4.  
The DEPARTMENT.

75. **I. HYDRAULICS AND SANITARY ENGINEERING.** — For seniors; juniors may elect. Hydrostatics, theoretical hydraulics, orifices, weirs, pipes, conduits, water supply, hydraulic motors, sewers and sewage treatment. Textbook and lectures.  
5 class hours. Credit, 5.  
The DEPARTMENT.

76. **I. MATERIALS OF CONSTRUCTION, FOUNDATIONS AND MASONRY CONSTRUCTION.** — For seniors; juniors may elect. Textbook and lectures.  
4 class hours. 1 2-hour laboratory period, credit, 5.  
The DEPARTMENT.

77. **II. ROADS AND RAILROADS.** — For seniors; juniors may elect. Topographic and higher surveying, highway construction, earthwork, pavements and railroad construction. Textbook and lectures.  
3 class hours. Credit, 3.  
The DEPARTMENT.

78. **III. ROADS AND RAILROADS.** — For seniors; juniors may elect. As stated under Course 77.  
3 2-hour laboratory periods, credit, 3.  
The DEPARTMENT.

Prerequisite, Mathematics 77.

79. **I. APPLIED MECHANICS.** — Seniors. A course in applied mechanics, based on the calculus, with problems. Textbooks and lectures.  
5 class hours. Credit, 5.  
The DEPARTMENT.

Prerequisites, Mathematics 51, 52.

### Microbiology.

Professor MARSHALL, Assistant Professor ITANO, Mr. NEILL.

Three objectives are sought in the arrangement of the courses following: (1) An introductory course (50) needed in the general training of every college student. (2) An introductory course (50) followed by a specific course (as 80, 81, 82, 83), necessary to every student engaged in the Division of Agriculture, with which the specific course deals. (3) An introductory course (50) followed by Courses 51, 52, 75, 76 and 81, preparatory for students who are aiming to specialize in agricultural microbiology. (Courses 75, 76 and 81 are adapted to those having Course 50 only, and are also adapted to those majoring in microbiology).

The microbiological work is housed in a newly constructed building especially designed for it. There are 4 class laboratory rooms, 8 private laboratory rooms, 1 lecture room, 5 incubator rooms, 3 sterilizing rooms, 3 hood rooms, 3 washing rooms, 3 inoculating rooms, 3 weighing rooms, an animal room, a

photographic and a dark room, a sub-basement refrigerator room, a library and 4 office rooms.

The class laboratory rooms are so arranged that individual desks are available for student use. Hot and cold water and gas connections are convenient for each desk; high-pressure steam and electric connections are also available. The building is well lighted and of sanitary construction; all the walls are of brick, and the building is fireproof.

The library is equipped with such books and current periodicals as are useful in the conduct of bacteriological work and investigations. Twenty-four scientific magazines are available regularly.

There are incubators, both electric and gas, hot-air sterilizers, ordinary steam sterilizers, autoclaves, an inspissator, blood-testing apparatus, vacuum apparatus, air-pressure apparatus, shaker, grinder, centrifugal machines, a water still of 5 gallons per hour capacity, Hoskins' combustion furnace, a balopticon, complete microphotographic equipment, microscopes, microtome, and such other apparatus, glassware and chemicals as are needed for extensive and intensive work.

#### *Elective Courses.*

50. **I, II and III.** INTRODUCTORY AND GENERAL MICROBIOLOGY. — For juniors; seniors may elect. Aims to provide elementary basis for microbial studies and interpretation, to enable students to pursue special pertinent courses which will serve as supports in practical electives or majors, and to furnish students with such material as will be valuable in understanding public health problems. Three hours scheduled, five hours by arrangement. 2 class hours.

6 laboratory hours, credit, 5.

Professor MARSHALL and Mr. NEILL.

51. **II and III.** MORPHOLOGICAL, CULTURAL AND PHYSIOLOGICAL MICROBIOLOGY. — For juniors; seniors may elect. Types of micro-organisms, technic of handling, methods of culture and functions of micro-organisms are considered. This course is fundamental to all advanced and extended microbiological studies. One hour will be scheduled.

10 laboratory hours, credit, 5.

Mr. NEILL.

Prerequisite, Microbiology 50.

52. **III.** ADVANCED MORPHOLOGICAL, CULTURAL AND PHYSIOLOGICAL MICROBIOLOGY. — For juniors; seniors may elect. The purpose of this course is to prepare the student for a more intimate knowledge of microbiological agricultural problems. To accomplish this object it is necessary to provide more advanced technic and methods of culture, together with a more extensive knowledge of micro-organisms and their functions. One hour will be scheduled.

10 laboratory hours, credit, 5.

Assistant Professor ITANO.

Prerequisite, Microbiology 50.

75. **II.** AGRICULTURAL MICROBIOLOGY. — For seniors; juniors may elect. This general comprehensive course is designed to cover in an elementary manner those subjects only which confront the student of general agricul-

ture, — the microbiological features of air, water, sewage, soil, dairy, fermentations, food, vaccines, antisera, microbial plant infections, methods and channels of infections, immunity and susceptibility, microbial infections of man and animals, methods of control or sanitary and hygienic practices. One hour will be scheduled.

10 laboratory hours, credit, 5.  
Assistant Professor ITANO.

Prerequisite, Microbiology 50.

76. **III. AGRICULTURAL MICROBIOLOGY.** — For seniors; juniors may elect. As stated under Course 75. One hour will be scheduled.

10 laboratory hours, credit, 5.  
Assistant Professor ITANO.

Prerequisites, Microbiology 50 and 75.

80. **II. SOIL MICROBIOLOGY.** — For seniors; juniors may elect. Such subjects as the number and development of micro-organisms in different soils; the factors which influence their growth, food, reaction, temperature, moisture and aeration; the changes wrought upon inorganic and organic matter in the production of soil fertility, ammonification, nitrification and denitrification; fixation of nitrogen symbiotically and non-symbiotically; methods of soil inoculation receive attention. One hour will be scheduled.

10 laboratory hours, credit, 5.  
Assistant Professor ITANO.

Prerequisite, Microbiology 50.

81. **I. HYGIENIC MICROBIOLOGY.** — For seniors; juniors may elect. An attempt will be made to select for this course certain material which should be the possession of every individual, and which is basic to public hygiene and sanitation, as applied to man and animals. The microbiology of water supplies, food supplies, vaccines, antisera or antitoxins; the channels by which micro-organisms enter the body, the influence of body fluids and tissues upon them, body reactions with micro-organisms (susceptibility and immunity); the micro-organisms of some of the most important infectious diseases, methods of control, including disinfectants and disinfection, antiseptics, antiseptis and asepsis, will be treated. One hour will be scheduled.

10 laboratory hours, credit, 5.  
Assistant Professor ITANO.

Prerequisite, Microbiology 50.

82. **I. DAIRY MICROBIOLOGY.** — For seniors; juniors may elect. Special emphasis will be placed upon milk supplies. The microbial content of milk, its source, its significance, its control; microbial taints and changes in milk; groups or types of organisms found in milk; milk as a carrier of disease-producing organisms; the value of straining, aeration, clarification, centrifugal separation, temperature, pasteurization; the abnormal fermentations of milk; bacteriological milk standards and their interpretation; ripening of milk and cream; the bacterial content of butter; a passing survey of the microbiology

of cheeses; a study of special dairy products, as ice cream, condensed milk, artificial milk drinks (the products of microbial actions), represents a list of topics considered.

10 laboratory hours, credit, 5.

Professor MARSHALL and Mr. NEILL.

Prerequisite, Microbiology 50.

83. **I. FOOD MICROBIOLOGY.** — For seniors; juniors may elect. A study of the principles of food preservation, and food preservation by means of drying, canning, refrigerating and addition of chemicals, will be pursued. Food fermentations, as illustrated by bread, pickles, sauerkraut, ensilage, vinegar, wine, etc., will be examined. Decomposition of foods, as may be seen in meat, oysters, fish, milk, etc., as well as diseased and poisonous foods, will receive consideration. Contamination of food supplies by means of water, sewage, handling, exposure, diseased persons, etc., is of especial significance, and will be demonstrated by laboratory exercises. Laboratory inspection of foods is now a subject of great import and will be given attention. One hour will be scheduled.

10 laboratory hours, credit, 5.

Professor MARSHALL and Mr. NEILL.

Prerequisite, Microbiology 50.

#### SPECIAL COURSES FOR WOMEN.

1. **I. ELEMENTARY MICROBIOLOGY.** — For freshmen. The course will be devoted to the various types of micro-organisms, their distribution in nature and their characterization. Such methods as are essential for examination, manipulation and culturing will be studied and employed.

6 laboratory periods, credit, 3.

Professor MARSHALL and Mr. NEILL.

In place of Military 1, tactics; Military 4, drill; fall term, freshmen.

3. **III. ELEMENTARY MICROBIOLOGY.** — For freshmen. Continuation of 1.

4 laboratory periods, credit, 2.

Professor MARSHALL and Mr. NEILL.

In place of Military 3, tactics; Military 6, drill; spring term, freshmen.

25. **I. PERSONAL HYGIENE.** — For sophomores. Such subjects as the hygiene of the mouth and teeth, the gastro-intestinal tract, food, the skin, respiration apparatus, ear, eye and nervous system are reviewed. The value of bathing, clothing, physical exercise, etc., are considered. Attention will be given to emergencies, accidents of "first aid," and such other matters as usually fall within this category.

2 class hours, credit, 2.

Professor MARSHALL.

In place of Military 25, tactics; Military 28, drill; fall term, sophomores.

**27. III. SANITARY SCIENCE.** — For sophomores. The usual topics of sanitary science, as ventilation, heating, plumbing, water supply, sewage disposal, food control and communicable diseases, will be treated wholly from the standpoint of individual and public health control.

2 class hours, credit, 2.

Professor MARSHALL.

In place of Military 27; Military 30; spring term, sophomores.

### Physics.

Professor HASBROUCK, Professor HARRINGTON, Mr. TOWER.

The fundamental and basic importance of the laws and phenomena of physics makes necessary no explanation of the introduction of this subject into the curriculum of an agricultural college. The logical development of the subject emphasizes the importance of physics as a science in itself. Special emphasis is laid, however, on the correlation of the principles studied with the sciences of agriculture, botany, chemistry and zoölogy, thus furnishing an extra tool by use of which the student's work in all the subjects may be more effective.

In Courses 25, 26 and 27 the subject-matter is presented with the idea of its special application primarily in the work in agriculture and general science. The full year's work is advised for all students continuing work specifically in the Division of Science. Courses 25 and 26 are required of all students. Course 29 is advised for students expecting to do special work in farm mechanics or general farm practice. The subject-matter is especially selected and arranged for its practical application rather than its theoretical development. Courses 50, 51 and 52 are advised for students in chemistry, general biology, microbiology and general science. The subject-matter is selected, and the courses developed, with the idea of making the student proficient in laboratory manipulation. Sufficient theory is given in connection with the work to enable the student to apply the knowledge and practice thus gained in the departments indicated above.

The department has at its command a building on the east campus, containing a general lecture room and laboratory for sophomore work, a laboratory for junior work, and in the basement one small laboratory for quantitative work in light measurement. There is also in the basement a fairly well-equipped shop for the repair and construction of apparatus used in the department work. The usual apparatus for the demonstration in the lecture room is in the possession of the department. The laboratory equipment is such as to enable the department to offer qualitative work in mechanics, heat, electricity and light.

### *Required Courses.*

**25. I. GENERAL PHYSICS.** — Sophomores. Mechanics of solids and fluids. This course includes statics, with equilibrium of rigid bodies, work, energy and friction; kinetics, considering rectilinear motion and motion in a curved path; harmonic motion; rotation of rigid bodies, including kinematics of rotation; liquids and gases, with properties of fluids at rest and in motion; properties of matter and its internal forces, including elasticity, capillarity, surface tension.

3 class hours.

1 2-hour laboratory period, credit, 4.

Professor HASBROUCK and HARRINGTON.



26. **II. ELECTRICITY AND MAGNETISM.** — Sophomores. The work in electricity includes such subject-matter as magnetism, electrostatics, electric currents with their production, chemical, heating and mechanical effects; battery cells, measurement of voltage, current flow and resistance, motors and generators.

2 class hours.

1 2-hour laboratory period, credit, 3.

Professor HARRINGTON.

*Elective Courses.*

27. **III. HEAT AND LIGHT.** — For sophomores; juniors and seniors may elect. Thermometry, expansion, colorimetry and specific heat, transmission of heat, changes of state, radiation and absorption. Wave theory of light, optical instruments, analysis of light, color, interference, diffraction, polarization.

4 class hours.

1 2-hour laboratory period, credit, 5.

Professors HASBROUCK and HARRINGTON.

29. **III. APPLIED ELECTRICITY.** — For sophomores; juniors and seniors may elect. Wiring and testing of commercial equipment, such as storage cells, dynamos, motors, engine ignitors and distributors, heaters, transformers, etc. Laboratory work, accompanied by notes and required reading. Elective only by arrangement with instructor.

1 class hour.

2 2-hour laboratory periods, credits, 3.

Professor HARRINGTON.

Prerequisite, Physics 26.

50. **I. ELECTRICITY, HEAT AND LIGHT.** — For juniors; seniors may elect.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professor HARRINGTON.

Prerequisite, Physics 27.

51. **II. ELECTRICITY, HEAT AND LIGHT.** — For juniors; seniors may elect. Continuation of Course 50.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professor HARRINGTON.

Prerequisite, Physics 50.

52. **III. ELECTRICITY, HEAT AND LIGHT.** — For juniors; seniors may elect. Continuation of Courses 50 and 51.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professor HARRINGTON.

Prerequisite, Physics 51.

**Veterinary Science.**

Professor PAIGE, Professor GAGE.

The courses in veterinary science have been arranged to meet the needs (1) of students who propose following practical agriculture; (2) of prospective students of human and veterinary medicine; and (3) of teachers and laboratory workers in the biological sciences.

The department occupies a modern laboratory and hospital stable, built in accordance with the latest principles of sanitation. Every precaution has

been taken in the arrangement of details to prevent the spread of disease, and to provide for effective heating, lighting, ventilation and disinfection.

The main building contains a large working laboratory for student use, and several small private laboratories for special work. There is a lecture hall, a museum, a demonstration room, a photographing room and a workshop. The hospital stable contains a pharmacy, an operating hall, a post-mortem and dissecting room, a poultry section, a section for cats and dogs, and 6 sections, separated from each other, for horses, cattle, sheep and swine. The laboratory equipment consists of a dissectible Auzoux model of the horse and Auzoux models of the foot and the leg, showing the anatomy and the diseases of every part. The laboratories also have modern, high-power microscopes, microtomes, incubators and sterilizers, for work in every department of veterinary science, including pathology, serology and parasitology. There are skeletons of the horse, the cow, the sheep, the dog and the pig, and a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts and diagrams.

*Elective Courses.*

50. **I. VETERINARY HYGIENE AND STABLE SANITATION.** — For juniors; seniors may elect. This course is intended to familiarize the student with the relation of water, food, air, light, ventilation, care of stables, disposal of excrement, individual hygiene, etc., to the prevention of disease in farm animals. 5 class hours.

Credit, 5.

Professor PAIGE.

51. **I. COMPARATIVE (VETERINARY) ANATOMY.** — For seniors; juniors may elect. The anatomy of the horse is studied in detail, and that of other farm animals compared with it where differences exist. This course is essential for those students wishing to elect Course 76.

5 class hours.

Credit, 5.

Professor PAIGE.

75. **II. GENERAL VETERINARY PATHOLOGY. MATERIA MEDICA AND THERAPEUTICS.** — For juniors; seniors may elect. In this course such fundamental and general pathological conditions are studied as inflammation, fever, hypertrophy, atrophy, etc., a knowledge of which is essential in the diagnosis, prevention and treatment of disease. The course in pathology is followed by one in materia medica and therapeutics, dealing with the origin, preparation, pharmacology, pharmacy, administration and therapeutic use of the more common drugs. Poisonous plants and symptoms and treatment of plant poisoning are also considered.

5 class hours.

Credit, 5.

Professor PAIGE.

76. **II. THEORY AND PRACTICE OF VETERINARY MEDICINE; GENERAL, SPECIAL AND OPERATIVE SURGERY.** — For seniors; juniors may elect. A course intended to familiarize the student with the various medical and surgical diseases of the different species of farm animals. Particular attention is given to diagnosis and first-aid treatment. The student is taught the technique

of simple surgical operations that can with safety be performed by the stock owner. Lectures, demonstrations and practice. This course should be taken in conjunction with Course 51.

5 class hours.

Credit, 5.

Professor PAIGE.

Prerequisite, Veterinary 75.

78. **I. ESSENTIALS OF GENERAL PATHOLOGY.**—For seniors; juniors may elect. This course is planned to introduce the student to some of the essential anatomical, histological and general physiological phenomena essential to the understanding of some of the simple general pathological conditions found in domestic animals. Some of the common methods of diagnosis will be considered in the laboratory. The various chemical and biological reactions and tests will be presented from the standpoint of pure science, showing applications of chemistry and biology. The course will serve to liberally educate and stimulate in the student of agriculture the appreciation of some of the methods used in animal pathology for detecting and controlling some of the more common animal diseases. Lectures, demonstration and laboratory work.

2 3-hour laboratory periods, credit, 3.

Professor GAGE.

79. **II. ESSENTIALS OF GENERAL ANIMAL PATHOLOGY.**—For seniors; juniors may elect. This is a continuation of Course 78, and is devoted to a study of some of the common pathological conditions by means of prepared sections, the aim being to demonstrate to the student abnormal animal histological structures commonly observed when material from various cases of animal diseases is prepared for microscopical study. Some of the biological products used in protecting animals against disease will be considered.

2 3-hour laboratory periods, credit, 3.

Professor GAGE.

Prerequisite, Veterinary 78.

80. **III. ESSENTIALS OF GENERAL ANIMAL PATHOLOGY.**—For seniors; juniors may elect. As stated in Courses 78 and 79.

2 3-hour laboratory periods, credit, 3.

Professor GAGE.

Prerequisite, Veterinary 79.

85. **I. AVIAN PATHOLOGY.**—For seniors; juniors may elect. A course in poultry diseases. The object of this course is to present information concerning the common diseases of poultry, their etiology, diagnosis and prevention. The work will consist of a systematic study of the diseases of the alimentary tract, liver and abdominal region, followed by a study of the diseases of the respiratory system, circulation and kidneys. The important disease-producing external and internal parasites will be considered; also diseases of the skin and reproductive organs. Lectures and demonstrations.

2 3-hour laboratory periods, credit, 3.

Professor GAGE.

86. **II. AVIAN PATHOLOGY.** — For seniors; juniors may elect. As stated under Course 85, also devoted to the study of some of the special diseases of poultry. Recent methods used in the control of these diseases will be considered and opportunity offered the student for demonstrating various disease processes by means of prepared slides. Lectures, demonstrations and laboratory work.

2 3-hour laboratory periods, credit, 3.

Professor GAGE.

Prerequisite, Veterinary 85.

87. **III. AVIAN PATHOLOGY.** — For seniors; juniors may elect. As stated under Courses 85 and 86.

2 3-hour laboratory periods, credit, 3.

Professor GAGE.

Prerequisite, Veterinary 86.

### **Zoölogy and Geology.**

Professor GORDON, Dr. ABBOTT.

The elective courses in zoölogy and geology in practice generally stand as offerings available to students who wish either to supplement their work in other departments or to continue their work in zoölogy or geology. They have definite objectives, either as supporting subjects or as courses designed to enlarge the student's knowledge in the subject pursued.

The building occupied jointly by the department of entomology and the department of zoölogy and geology has for the work in zoölogy and geology spacious laboratories equipped with gas, compound microscopes and the accessories needed for study, research and demonstration in these subjects. There are two commodious lecture rooms, used jointly by the two departments. The Zoölogical Museum has a representative collection of several thousand specimens of animals, and is drawn upon for material illustrating the various courses. The curator is Professor Gordon.

### **ZOÖLOGY.**

#### *Required Course.*

25. **I. PRINCIPLES OF ZOÖLOGY.** — Sophomores.

2 class hours.

2 2-hour laboratory periods, credit, 4.

Professor GORDON and Dr. ABBOTT.

#### *Elective Courses.*

27. **III. ELEMENTS OF MAMMALIAN ANATOMY.** — Sophomores; juniors and seniors may elect.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Professor GORDON.

50. **I. SYNOPSIS INVERTEBRATE ZOÖLOGY.** — Juniors; seniors may elect.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Dr. ABBOTT.

Prerequisite, Zoölogy 25.

51. **II. SYNOPTIC INVERTEBRATE ZOÖLOGY.** — Juniors; seniors may elect. Continuation of Course 50.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Dr. ABBOTT.

Prerequisite, Zoölogy 50.

52. **III. SYNOPTIC INVERTEBRATE ZOÖLOGY.** — Juniors; seniors may elect. Continuation of Course 51.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Dr. ABBOTT.

Prerequisite, Zoölogy 51.

53. **I. ELEMENTS OF MICROSCOPIC TECHNIQUE.** — Juniors; seniors may elect.

3 2-hour laboratory periods, credit, 3.

Professor GORDON.

54. **II. ELEMENTS OF HISTOLOGY.** — Juniors; seniors may elect.

3 2-hour laboratory periods, credit, 3.

Professor GORDON.

Prerequisite, Zoölogy 53.

55. **III. ELEMENTS OF HISTOLOGY.** — Juniors; seniors may elect.

3 2-hour laboratory periods, credit, 3.

Professor GORDON.

Prerequisite, Zoölogy 54.

58. **II. CONSERVATIONAL ZOÖLOGY.** — Juniors; seniors may elect. For students who are interested in the conservation of wild life, especially the natural fauna of the State. Not offered for the year 1919-20.

2 class hours.

1 2-hour laboratory period, credit, 3.

The DEPARTMENT.

75. **I. SPECIAL ZOÖLOGY.** — Juniors, seniors, graduates and others may apply for such special work as they are qualified to undertake.

1 class hour.

2 2-hour laboratory periods, credit, 3.

The DEPARTMENT.

76. **II. SPECIAL ZOÖLOGY.** — Same as Course 75.

1 class hour.

2 2-hour laboratory periods, credit, 3.

The DEPARTMENT.

77. **III. SPECIAL ZOÖLOGY.** — Same as Course 75.

1 class hour.

2 2-hour laboratory periods, credit, 3.

The DEPARTMENT.

78. **II. ORNITHOLOGY.** — Juniors, seniors and others. The taxonomic characters, migrations and distribution of the birds.

1 class hour.

2 2-hour laboratory periods, credit, 3.

The DEPARTMENT.

79. **III.** ECONOMIC AND FIELD ORNITHOLOGY. — A review and study in the field of the food and other habits of Massachusetts birds.

1 class hour.

2 2-hour laboratory periods, credit, 3.

The DEPARTMENT.

#### GEOLOGY.

##### *Required Course.*

2. **II.** AGRICULTURAL GEOLOGY. — Freshmen.

2 class hours.

Credit, 2.

Professor GORDON.

##### *Elective Course.*

27. **III.** GENERAL GEOLOGY. — Sophomores; juniors and seniors may elect.

3 class hours.

2 2-hour laboratory periods, credit, 5.

Professor GORDON.

**DIVISION OF THE HUMANITIES.**Professor SPRAGUE.<sup>1</sup>**Economics and Sociology.**Professor SPRAGUE.<sup>1</sup>

Courses in 1920-21, given by Assistant Professor Parker, Acting Head of the Department, assisted by Professors Tyler and Crook of Amherst College, and Professor Sims.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

The courses in economics and sociology are planned with the purpose of giving the student that knowledge and understanding of the important factors and problems in this field of study and life which every active citizen and educated man ought to have.

*Elective Courses.*

**26. II. CIVILIZATIONS, ANCIENT AND MODERN.** — For sophomores; others may elect. This course studies the evolutionary origin and history of man; characteristics of primitive man, departure from the animal status and beginnings of civilization; origin and development of industries, arts and sciences; the evolution of languages, warfare, migrations and social institutions; a study of the powerful natural and human forces that have brought man from the early stages to modern development; characteristic features of the leading civilizations and races of ancient and modern times; beneficial and dangerous factors in American life in view of the history of human civilization. 5 class hours.

Credit, 5.

Professor TYLER.

**50. II. BUSINESS AND INDUSTRY.** — For juniors and seniors. The forms, organization, administration and labor problems of business. This course is devoted to the following subjects: methods of organizing, financing and administering corporations and partnerships; forms of business administration, wholesaling, jobbing, retailing, advertising, credits and collections; systems of industrial remuneration for wage earners, co-operation and preserving industrial peace; problems concerned with protective legislation for workmen and employers, sweated industries, prison labor, child labor and industrial education.

5 class hours.

Credit, 5.

Professor CROOK.

**51. I. INTRODUCTION TO ECONOMIC PRINCIPLES AND PROBLEMS.** — For juniors. This course is devoted to the study of the following subjects: definitions of economic terms, such as wealth, capital, value, etc.; factors of production, exchange and consumption; principles of economic production, supply and demand, diminishing returns, division of labor, productive organization, concentration of capital and labor, trust and monopoly problems, public control of production and distribution; principles of exchange, theories of value,

<sup>1</sup> On leave of absence, 1920-21.

money and its problems; international trade, tariff and free trade theories, American merchant marine, reciprocity, and trade treaties; forms of income, wages, interest, rent, profits and the forces which govern them; principles of spending, economy, luxury, conservation of individual and national resources; principles and agencies for saving, investments, banks, building associations, insurance of all kinds; schemes for social organization; socialism, communism, industrial democracy. Textbook and readings.

5 class hours.

Credit, 5.

Professor CROOK.

75. **I. SOCIAL INSTITUTIONS AND SOCIAL REFORMS.** — For seniors; juniors by permission. This course is devoted to the study of the social institutions, such as the family, the State, property, religions; and to such current problems as eugenics, race suicide, divorce, crime and delinquent classes, prison reform, prevention and treatment of dependents and defectives, poverty, its causes and preventions; constructive modern social reform movements for insurance of wage earners, protection of childhood, assurance of safety, health and play time for all classes. The correctional and charitable institutions of Massachusetts will be studied in considerable detail.

5 class hours.

Credit, 5.

Professor SIMS.

77. **III. PUBLIC FINANCE, TAXATION, MONEY AND BANKING.** — For seniors. This course studies systems and problems of taxation as they are found in Europe and America; objects for spending public revenue; public debts and methods of organizing them; systems of money and currency problems of America; types, methods and functions of banks; economic and financial crises and depressions in the United States; modern war finance. Readings and lectures.

5 class hours.

Credit, 5.

Professor CROOK.

### History and Government.

Assistant Professor PARKER.

#### *Elective Courses.*

50. **III. GOVERNMENT.** — For juniors; seniors may elect. This course will cover subjects as follows: forms and working methods of the governments of Great Britain, Germany, France, Russia, Switzerland, New Zealand and Canada; historic types and theories of government; forms and methods of Federal, State and local governments in America; progress and problems of democracy and new reform movements in organization and administration; new tendencies towards social legislation and extension of governmental control over broader interests of the people.

5 class hours.

Credit, 5.

Assistant Professor PARKER.

54. **I. MODERN EUROPEAN HISTORY.** — Juniors; seniors may elect. This course will take up the modern history of the principal countries of Europe, especially the great movements and revolutions that developed the nations up to the present generation.

3 class hours.

Credit, 3.

Assistant Professor PARKER.



79. **II. EUROPEAN HISTORY SINCE 1870.** — For seniors; juniors may elect. In this course the Franco-Prussian War and the formation of the German Empire, the unification of Italy, the Third French Republic, European Expansion in the East, the Russo-Japanese War, and the origin, events and probable results of the War of 1914, will be studied in some detail. While a continuation of Course 54, this course will be complete in itself, and may be elected by those who have had no history training. Its aim is to provide the basis for an understanding of present-day conditions, and for an intelligent participation in world affairs.

3 class hours.

Credit, 3.

Assistant Professor PARKER.

### Languages and Literature.

Professor LEWIS, Professor PATTERSON, Professor MACKIMMIE, Professor —, Professor ASHLEY, Assistant Professor PRINCE, Assistant Professor JULIAN, Mr. RAND, Miss GOESSMANN.

#### ENGLISH.

##### *Required Courses.*

1. **I.** 2. **II.** 3. **III.** ENGLISH. — Freshmen. Composition. Intended to teach straight thinking, sound structure, clear and correct expression. Lectures, recitations, theme writing and conferences.

3 class hours each term.

Credit, 3 each term.

Professor PATTERSON, Assistant Professor PRINCE and Mr. RAND.

25. **I.** 26. **II.** 27. **III.** ENGLISH. — Sophomores. A general reading course in English literature.

2 class hours each term.

Credit, 2 each term.

Professor LEWIS and Miss GOESSMANN.

##### *Elective Courses in English Language and Literature.*

50. **I.** ENGLISH POETRY OF THE ROMANTIC PERIOD (1921-22). — This course alternates with course 53. For juniors; seniors may elect. A course in history, appreciation and understanding. Some of the writers studied are Gray, Goldsmith, Burns, Scott, Wordsworth, Coleridge, Byron, Keats and Shelley.

3 class hours.

Credit, 3.

Professor PATTERSON.

51. **II.** ENGLISH POETRY IN THE NINETEENTH CENTURY. — This course alternates with Course 54. For juniors; seniors may elect. In general, this course is like Course 50. Tennyson, Browning, Mrs. Browning, Arnold, Clough, the Rossettis, Morris and Swinburne are among the writers to be studied.

3 class hours.

Credit, 3.

Professor LEWIS.

57. **III.** ENGLISH POETRY IN THE NINETEENTH CENTURY. — This course alternates with Course 58. For juniors; seniors may elect. As stated under Course 51.

3 class hours.

Credit, 3.

Professor LEWIS.

52. **III. ENGLISH WRITERS FROM MILTON TO POPE.** — For juniors; seniors may elect. A survey course that will emphasize the leading writers, literary currents and the thought of the period. Some of the writers studied are Milton, Dryden, Addison, Swift and Pope.

3 class hours.

Credit, 3.

Professor PATTERSON.

53. **I. ENGLISH PROSE OF THE ROMANTIC PERIOD.** — For juniors; seniors may elect. A course in English prose paralleling Course 51. Some of the writers studied are Goldsmith, Coleridge, Lamb, DeQuincey and Hazlitt.

3 class hours.

Credit, 3.

Professor PATTERSON.

54. **II. ENGLISH PROSE IN THE NINETEENTH CENTURY (1921-22).** — For juniors; seniors may elect. This course parallels Course 51. Among the writers considered will be Macaulay, Carlyle, Ruskin, Newman and Arnold.

3 class hours.

Credit, 3.

Professor LEWIS.

55. **III. ENGLISH PROSE IN THE NINETEENTH CENTURY (1921-22).** — For juniors; seniors may elect. As stated under Course 54.

3 class hours.

Credit, 3.

Professor LEWIS.

56. **II. AMERICAN LITERATURE.** — For juniors; seniors may elect. Intended to give a general survey of literature in America, especially in the nineteenth century, with an introduction to the work of the best known writers, and with especial attention to the relations between national life and history and national thought as expressed in literature. The usual authors — Irving, Cooper, Bryant, Poe, Longfellow, Emerson, Hawthorne, Whittier, Parkman, Lowell, Holmes, Whitman, Lanier — will be discussed.

3 class hours.

Credit, 3.

Assistant Professor PRINCE.

57. **III. AMERICAN LITERATURE.** — For juniors; seniors may elect. As stated under Course 55.

3 class hours.

Credit, 3.

Assistant Professor PRINCE.

Prerequisite, English 55.

60. **I. THE LITERATURE OF RURAL LIFE.** — For juniors; seniors may elect. A critical and appreciative study of writers, both in prose and poetry, who have interpreted nature from the viewpoint of the lover of country life, and those who have idealized agriculture, horticulture and other rural pursuits, together with those who have upheld as an ideal the development of a rural environment in cities.

3 class hours.

Credit, 3

Miss GOESSMANN.

61. **II.** THE LITERATURE OF RURAL LIFE. — For juniors; seniors may elect. As stated under Course 60.

3 class hours.

Credit, 3.

Miss GOESSMANN.

Prerequisite, English 60.

75. **III.** PROSE FICTION. — The short story or the novel. For seniors; juniors may elect. Readings, reports and discussions. [Not given in 1920-21.]

3 class hours or library equivalents.

Credit, 3.

79. **II.** THE DRAMA. — For seniors; juniors may elect. A cursory survey of early English drama, its origin, forms and meaning, will be followed by a careful study of Shakespeare. Two of his plays will be analyzed in detail, and many others will be read and discussed.

3 class hours.

Credit, 3.

Mr. RAND.

80. **III.** THE DRAMA. — For seniors; juniors may elect. The course will trace the development of modern drama, especial attention being given to plays by Congreve, Goldsmith, Sheridan, Robertson, Jones, Pinero, Fitch, Shaw, Moody and Ibsen.

3 class hours.

Credit, 3.

Mr. RAND.

#### APPLIED ENGLISH — RURAL JOURNALISM.

The courses in rural journalism have two chief aims: first, to turn the student's attention toward matters of contemporary concern; second, to provide training for students who may wish to enter journalism (especially agricultural or industrial journalism or non-urban newspaper work), or who are preparing for the numerous other vocations in which acquaintance with newspaper practices and requirements is of value. All of the courses afford constant practice in writing. So far as conditions permit, instruction is largely individual.

50. **I.** ADVANCED COMPOSITION. — For juniors; seniors may elect. Advanced work in expository writing based upon specimens by contemporary authors and upon the personal experience of the student. Particular attention is given to organization, diction and style.

Credit, 3.

Mr. RAND.

51. **II.** ADVANCED COMPOSITION. — For juniors; seniors may elect. Work in journalistic and fictional narrative with supplementary reading.

Credit, 3.

Mr. RAND.

52. **III.** ADVANCED COMPOSITION. — For juniors; seniors may elect. The preparation of theses and similar manuscripts along such lines as the student may desire. Clearness and readability are the ends to be attained.

Credit, 3.

Mr. RAND.

53. I. 54. II. 55. III. NEWS-GATHERING AND NEWS-WRITING. — For juniors; seniors may elect. The foundation aims and conceptions of journalism; reporting. Central purpose, to develop ability to pick out essentials from inessentials, perceive elements of interest, and present facts which appeal to the reader. Courses 53, 54 and 55 are suited to students whose vocation may require the popular presentation of technical or other information; *e.g.*, extension workers, county agents, agricultural-school instructors, experiment-station editors, survey and other social-service workers, men engaged in sociological or economic investigations, landscape architects and civil and sanitary engineers.

6 laboratory hours or class equivalents, credit, 3.

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77. I. 78. II. 79. III. EDITORIAL MATERIALS AND METHODS. — For seniors; juniors may elect. Readings, quizzes, reports and personal conferences; reading of daily papers and weekly reviews or rural-life periodicals; writing of editorial articles. Recommended to students who desire practice in discovering the significant aspects of matters of public attention and in effectively expressing comment thereon. [Not given in 1920-21.]

6 laboratory hours or class equivalents, credit, 3.

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80. I. 81. II. 82. III. ADVANCED JOURNALISTIC PRACTICE. — Seniors. Preparation, editing and publication in a newspaper of a rural-life page. [Not given in 1920-21.]

8 or 10 laboratory hours, credits, 4 or 5.

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#### PUBLIC SPEAKING.

##### *Required Course.*

1. I, II and III. PUBLIC SPEAKING. — Freshmen. Freshman public speaking is required in the first, second or third term, at the option of the instructor. The course is concerned with the actual problems which confront the man who would speak convincingly and persuasively. Much attention, therefore, is given to the preparation and delivery of extempore speeches. 1 class hour.

Credit, 1.

Professor PATTERSON, Assistant Professor PRINCE and Mr. RAND.

##### *Elective Courses.*

50. I. ARGUMENTATION. — For juniors; seniors may elect. The course aims to present the fundamental principles of argumentation as applied to oral and written discourse, and intends to develop in the student power to handle argument convincingly and persuasively. Lectures, discussions of leading questions of the day, practice in brief-drawing and the writing of forensics. The course is recommended for those who desire to enter the inter-collegiate debates.

3 class hours.

Credit, 3.

Assistant Professor PRINCE.

Prerequisites, Public Speaking 1, 2 or 3.

51. **II. OCCASIONAL ORATORY.** — For juniors; seniors may elect. The course involves a study of the elements of vocal expression and action; speeches on assigned subjects; prescribed reading; the preparation and delivery of several formal orations. Textbook, Shurter's "The Rhetoric of Oratory." The course is recommended for those who wish to enter the Flint contest.  
3 class hours. Credit, 3.

Assistant Professor PRINCE.

Prerequisites, Public Speaking 1, 2 or 3.

### French and Spanish.

Professor MACKIMMIE, —.

The aim of the courses in French and Spanish is to give the student a practical knowledge of these languages for the purpose of wider reading and research, to introduce him to some of their treasures in art and science, and through the literature to acquaint him with the people. In the elementary courses as much time as possible is given to oral work, to develop a speaking, as well as a reading, knowledge of the tongue.

#### FRENCH.

##### *Required Courses.*

1. **I. 2. II. 3. III. ELEMENTARY FRENCH.** — Freshmen; open upon arrangement to other students. The essentials of grammar are rapidly taught and will be accompanied by as much reading as possible. This course is required of freshmen presenting German for entrance who do not continue that language and have not studied French.  
3 class hours each term. Credit, 3 each term.

4. **I. 5. II. 6. III. INTERMEDIATE FRENCH.** — Freshmen; open upon arrangement to other students. Training for rapid reading. The reading of a number of short stories, novels and plays; composition, reports on collateral reading from periodicals and scientific texts in the library.  
3 class hours each term. Credit, 3 each term.

Professor MACKIMMIE.

Prerequisite, required of freshmen who present two years of French for entrance and do not take German.

##### *Elective Courses.*

25. **I. INTERMEDIATE FRENCH.** — For sophomores; open upon arrangement to other students. Training for rapid reading; the reading of a number of short stories, novels and plays; readings from periodicals and scientific texts in the library.  
3 class hours. Credit, 3.

Professor MACKIMMIE.

Prerequisites, French 1, 2 and 3.

26. **II. INTERMEDIATE FRENCH.** — For sophomores; open upon arrangement to other students. As stated under Course 25.  
3 class hours. Credit, 3.

Professor MACKIMMIE.

Prerequisite, French 25.

27. **III. INTERMEDIATE FRENCH.** — For sophomores; open upon arrangement to other students. As stated under Course 25.

3 class hours.

Credit, 3.

Professor MACKIMMIE.

Prerequisite, French 26.

28. **I. ADVANCED FRENCH.** — For sophomores; open upon arrangement to other students. A reading course. Balzac's "Eugénie Grandet" and "Le Père Goriot," and other masterpieces of the nineteenth century; Brunetière's "Honoré de Balzac" and Harper's "Masters of French Literature;" readings in the library and written reports.

3 class hours.

Credit, 3.

Prerequisites, French 4, 5 and 6.

29. **II. ADVANCED FRENCH.** — For sophomores; open upon arrangement to other students. As stated under Course 28.

3 class hours.

Credit, 3.

Prerequisites, French 4, 5 and 6.

30. **III. ADVANCED FRENCH.** — For sophomores; open upon arrangement to other students. General view of the history of French literature; Kastner and Atkins' "History of French Literature." Representative works of the important periods will be studied in class. Outside reading will be required.

3 class hours.

Credit, 3.

Prerequisites, French 25 and 26, or French 28 and 29.

50. **I. SCIENTIFIC FRENCH.** — For juniors; seniors may elect. This course is planned to meet the requirements of the individual student, and aims to equip him with exact English equivalents for the French scientific terms in his particular science. Word lists of scientific terms will be required, and also weekly readings and reports from scientific works in the subject in which he is majoring. Several scientific readers will be read.

3 class hours.

Credit, 3.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

51. **II. SCIENTIFIC FRENCH.** — For juniors; seniors may elect. As stated under Course 50.

3 class hours.

Credit, 3.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

52. **III. SCIENTIFIC FRENCH.** — For juniors; seniors may elect. As stated under Course 50.

3 class hours.

Credit, 3.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

75. **I. FRENCH LITERATURE.** — For seniors; juniors may elect. The object of Courses 75, 76 and 77 is to give an introduction to recent movements in French literature. Course 75 will deal with the drama, and plays by Augier, A. Dumas *filis*, Delavigne and some contemporary dramatists will be read and studied.

3 class hours.

Credit, 3.

Professor MACKIMMIE.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

76. **II. FRENCH LITERATURE.** — For seniors; juniors may elect. This course deals with the novel. Works by Flaubert, the De Goncourts and Zola will be read. Written reports are required on outside reading.

3 class hours.

Credit, 3.

Professor MACKIMMIE.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

77. **III. FRENCH LITERATURE.** — For seniors; juniors may elect. Modern criticism. Sainte-Beuve, "Causeries du Lundi" (Harper) and works by Taine and Renan. Reference book, Lanson's "Histoire de la Littérature Française."

3 class hours.

Credit, 3.

Professor MACKIMMIE.

Prerequisites, French 4, 5 and 6, or French 25, 26 and 27.

## SPANISH.

### *Elective Courses.*

50. **I. ELEMENTARY SPANISH.** — For juniors; seniors may elect. Open to other students upon arrangement. Grammar, with special drill in pronunciation; exercises in conversation and composition. Reading from a reader and selected short stories.

3 class hours.

Credit, 3.

Professor MACKIMMIE.

51. **II. ELEMENTARY SPANISH.** — For juniors; open to other students upon arrangement. As stated in Course 50.

3 class hours.

Credit, 3.

Professor MACKIMMIE.

Prerequisite, Spanish 50.

52. **III. ELEMENTARY SPANISH.** — For juniors; open to other students upon arrangement. As stated in Course 50.

3 class hours.

Credit, 3.

Professor MACKIMMIE.

Prerequisite, Spanish 51.

75. **I. MODERN SPANISH AUTHORS.** — Seniors. Reading from modern Spanish novel and drama. Translation of English into Spanish. Private reading.

3 class hours.

Credit, 3.

Professor MACKIMMIE.

Prerequisite, Spanish 52.

76. **II. MODERN SPANISH AUTHORS.** — Seniors. As stated in Course 75.  
3 class hours. Credit, 3.

Professor MACKIMMIE.

Prerequisite, Spanish 75.

77. **III. MODERN SPANISH AUTHORS.** — Seniors. As stated in Course 75.  
3 class hours. Credit, 3.

Professor MACKIMMIE.

Prerequisite, Spanish 76.

### German and Music.

Professor ASHLEY, Assistant Professor JULIAN.

#### GERMAN.

The courses in German are intended to give the student a reading knowledge of the language and to introduce to him some of the masterpieces of German literature. To the student interested in pursuing advanced reading in scientific German, opportunity is given to do corollary reading in his major subject, in collaboration with the head of that department.

#### *Required Courses.*

1. **I. 2. II. 3. III. ELEMENTARY GERMAN.** — Freshmen; open upon arrangement to other students. Grammar, composition and reading. Especial attention is given to oral work in German and to translation of English into German. Required of those presenting French for entrance who do not continue that language and have not studied German.

3 class hours each term.

Credit, 3 each term.

Professors ASHLEY and JULIAN.

4. **I. 5. II. 6. III. INTERMEDIATE GERMAN.** — Freshmen; open upon arrangement to other students. Selected works of Schiller, Heine and Goethe. Grammar review and advanced prose composition.

3 class hours each term.

Credit, 3 each term.

Professor ASHLEY.

Prerequisite, required of freshmen who present two years of German for entrance and do not take French.

#### *Elective Courses.*

25. **I. INTERMEDIATE GERMAN.** — For sophomores; open upon arrangement to other students. Reading of such works as Sudermann's "Frau Sorge," "Wilhelm Tell," "Die Journalisten," etc. Grammar review.

3 class hours.

Credit, 3.

Assistant Professor JULIAN.

Prerequisites, German 1, 2 and 3.

26. **II. INTERMEDIATE GERMAN.** — For sophomores; open upon arrangement to other students. As stated under Course 25.

3 class hours.

Credit, 3.

Assistant Professor JULIAN.

Prerequisite, German 25.



27. **III. INTERMEDIATE GERMAN.** — For sophomores; open upon arrangement to other students. As stated under Course 25.  
3 class hours.

Credit, 3.

Assistant Professor JULIAN.

Prerequisite, German 26.

28. **I. ADVANCED GERMAN.** — For sophomores; open upon arrangement to other students. Reading and studying of Goethe's most important literary productions.  
3 class hours.

Credit, 3.

Professor ASHLEY.

Prerequisites, German 4, 5 and 6.

29. **II. ADVANCED GERMAN.** — For sophomores; open upon arrangement to other students. Development of the German novel; rapid reading of great novelists.  
3 class hours.

Credit, 3.

Professor ASHLEY.

Prerequisite, German 28.

30. **III. ADVANCED GERMAN.** — For sophomores; open upon arrangement to other students. As stated under Course 29.  
3 class hours.

Credit, 3.

Professor ASHLEY.

Prerequisite, German 29.

50. **I. SCIENTIFIC GERMAN.** — For juniors; seniors may elect. Reading in German of modern magazine articles and works of a scientific nature. Different work assigned according to needs of individual students.  
3 class hours.

Credit, 3.

Professor ASHLEY.

Prerequisites, German 4, 5 and 6, or German 25, 26 and 27.

51. **II. SCIENTIFIC GERMAN.** — For juniors; seniors may elect. As stated under Course 50.  
3 class hours.

Credit, 3.

Professor ASHLEY.

Prerequisite, German 50.

52. **III. SCIENTIFIC GERMAN.** — For juniors; seniors may elect. As stated under Course 50.  
3 class hours.

Credit, 3.

Professor ASHLEY.

Prerequisite, German 51.

75. **I. GERMAN LITERATURE.** — Seniors. Advanced language and literary study. Conducted entirely in German. Lectures on German literature and history; life, customs and travel in Germany. Collateral readings, including masterpieces of different epochs, such as "Niebelungenlied," Goethe's "Faust" and one modern typical drama.  
3 class hours.

Credit, 3.

Professor ASHLEY.

Prerequisites, German 28, 29 and 30.

76. **II. GERMAN LITERATURE.** — Seniors. As stated under Course 75.  
3 class hours. Credit, 3.

Professor ASHLEY.

Prerequisite, German 75.

77. **III. GERMAN LITERATURE.** — Seniors. As stated under Course 75.  
3 class hours. Credit, 3.

Professor ASHLEY.

Prerequisite, German 76.

78. **I. CONVERSATION AND COMPOSITION.** — For seniors; juniors may elect. Translating connected English into German. Reproducing outside readings in German orally in class.

1 class hour.

Credit, 1.

Professor ASHLEY.

Prerequisites, German 4, 5 and 6, or German 25, 26 and 27.

79. **II. CONVERSATION AND COMPOSITION.** — For seniors; juniors may elect. As stated under Course 78.

1 class hour.

Credit, 1.

Professor ASHLEY.

Prerequisite, German 78.

80. **III. CONVERSATION AND COMPOSITION.** — For seniors; juniors may elect. As stated under Course 78.

1 class hour.

Credit, 1.

Professor ASHLEY.

Prerequisite, German 79.

## MUSIC.

### *Elective Courses.*

50. **I. HISTORY AND INTERPRETATION OF MUSIC.** — For juniors; seniors may elect. History of music among the ancients; medieval and secular music; epoch of vocal counterpoint; development of monophony opera and oratorio; life and works of the greatest representatives of the classical school, — Bach, Händel, Haydn, Gluck and Mozart.

1 class hour.

Credit, 1.

Professor ASHLEY.

51. **II. HISTORY AND INTERPRETATION OF MUSIC.** — For juniors; seniors may elect. A continuation of Course 50. The Romantic school; Beethoven, Schubert, Weber, Mendelssohn, Schumann, Chopin, Berlioz and Liszt; Wagner and the opera.

1 class hour.

Credit, 1.

Professor ASHLEY.

52. **III. HISTORY AND INTERPRETATION OF MUSIC.** — For juniors; seniors may elect. The Modern school and Modern composers.

1 class hour.

Credit, 1.

Professor ASHLEY.

**DIVISION OF RURAL SOCIAL SCIENCE.**

President BUTTERFIELD.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

**Agricultural Economics.**

Professor CANCE, Mr. SAWTELLE.

Instruction in agricultural economics is designed to show that the agricultural industry justifies its existence chiefly as a supplier of food and raw textile materials for human consumption; that agricultural success is measured by production of values rather than by production of volume of agricultural products; that the goal of the farmer is the largest net profit over a long-time period; that agricultural production includes all processes from purchase of seed and fertilizer and preparation of seedbed until the product reaches the consumer, including collection, transportation, storage, financing, packing, handling and selling; that a knowledge of the business of agriculture and agricultural commerce is to-day more necessary than a knowledge of agricultural technique.

The work of this department is conducted by means of lectures, readings and research in both library and field. A catalogue, now containing some 12,000 cards, covering the various phases of agricultural economics, is maintained. The department is also supplied with a large collection of maps, charts and statistical reports on the prices and supply of agricultural products. A goodly number of regular reports of the Bureau of Markets and other divisions of the United States Department of Agriculture are on file in the office of the department, and available for the use of students. Two series of bound volumes of bulletins are kept in the department offices, with duplicate series in the college library; one series already contains 12 volumes on "Co-operation in Agriculture," and the other, 15 volumes on "Marketing of Farm Products."

*Required Course.*

26. **II. AGRICULTURAL INDUSTRY AND RESOURCES.** — Sophomores. A descriptive course dealing with agriculture as an industry and its relation to physiography, movement of population, supply of labor, commercial development, transportation, public authority and consumers' demand. The principal agricultural resources of the United States will be studied with reference to commercial importance, geographical distribution, present condition and means of increasing the value of the product and cheapening cost of production. Lectures, assigned readings, class topics and discussions.  
5 class hours.

Credit, 5.

Professor CANCE.

*Elective Courses.*

50. **I. ELEMENTS OF AGRICULTURAL ECONOMICS.** — For juniors; seniors may elect. This course is designed to accompany or follow the course in elements of economics. It deals with the economic principles underlying the welfare

and prosperity of the farmer and those institutions upon which his economic success depends; the economic elements in the production and distribution of agricultural wealth; means of exchange; principles of rural credit; problems of land tenure and land values; taxation of farm property; and the maintenance of the economic status of the farmer. Lectures, text, readings, topics and field work.

5 class hours.

Credit, 5.

Professor CANCE.

51. **III. HISTORICAL AND COMPARATIVE AGRICULTURE.**—For juniors; seniors may elect. A general survey of agriculture, ancient and modern; feudal and early English husbandry; the later development of English agriculture; the course of agriculture in the United States, with special emphasis on the development of agriculture in New England. An attempt will be made to measure the influence of times, peoples and countries in producing different systems of agriculture, and to ascertain the causes now working to effect agricultural changes. Lectures, readings and library work. Students in education and rural journalism should find this course helpful.

5 class hours.

Credit, 5.

Mr. SAWTELLE.

52. **II. CO-OPERATION IN AGRICULTURE.**—For juniors; seniors may elect. The course treats of the history, principles and business relations of agricultural co-operation. (1) A survey of the development, methods and economic results of farmers' organizations and great co-operative movements; (2) the business organization of agriculture abroad, and the present aspects and tendencies in the United States; (3) the principles underlying successful co-operative endeavor among farmers, practical working plans for co-operative associations, with particular reference to credit and purchase and the marketing of perishable products. Lectures, text, assigned readings and practical exercises.

5 class hours.

Credit, 5.

Professor CANCE and Mr. SAWTELLE.

53. **III. THE AGRICULTURAL MARKET.**—For juniors; seniors and graduate students may elect. A study of the forces and conditions which determine the prices of farm products and the mechanism, methods and problems concerned with transporting, storing and distributing them. Supply and demand, course of prices, terminal facilities, the middleman system, speculation in agricultural products, protective legislation, the retail market and direct sales are taken up. The characteristics and possibilities of the New England market are given special attention. Lectures, readings, assigned studies and field work.

5 class hours.

Credit, 5.

Professor CANCE.

76. **II. TRANSPORTATION OF AGRICULTURAL PRODUCTS.**—For seniors and graduate students; juniors may elect. This course deals with the development of highway, waterway and railway transportation and its relation to the agricultural development of the country; the principles governing the

operation and control of transportation agencies; present-day problems relating to the shipment of farm products, rates, facilities and services; methods of reducing wastes in transportation; the economics of the good roads movement and of motor transportation. Lectures, text and field work.

5 class hours.

Credit, 5.

Professor CANCE and Mr. SAWTELLE.

77. **I. PROBLEMS IN AGRICULTURAL ECONOMICS.** — For seniors and graduate students; juniors may elect. An advanced course for students desirous of studying more intensively some of the economic problems affecting the farmer. Some of these are: land problems, — land tenure, size of farms, causes affecting land values, private property in land, taxation of farm property; special problems, — cost of producing farm products, farm labor in New England, immigration, agricultural credit. Opportunity will be given, if practicable, for field work, and students will be encouraged to pursue lines of individual interest.

5 class hours.

Credit, 5.

Professor CANCE.

78. **III. AGRICULTURAL CREDIT FACILITIES.** — For seniors and juniors. Lectures, discussions and assigned readings on credit needs of farmers; the legitimate use of credit in the acquisition of land, and the production, storage and marketing of agricultural products; the development of national and State rural credit institutions and laws; the powers and methods of operation of credit institutions with reference to the supply of credit for agricultural purposes; the methods by which the individual may increase his credit standing and borrowing power; ways in which the present credit facilities may be increased.

3 class hours.

Credit, 3.

Mr. SAWTELLE.

79. **I. AGRICULTURAL STATISTICS.** — For seniors, juniors and graduate students. This course deals with the nature and sources of agricultural statistics, the methods of obtaining numerical facts, of analyzing and drawing conclusions from statistical data, and the methods of presenting in a true and forceful manner the statistical facts of the agricultural industry. Opportunity is given in the laboratory for practice in the use of statistical methods and processes, and to acquire experience in dealing with practical statistical problems. The application of statistics and statistical methods in the fields of agricultural economics, extension work, education, journalism and the business matters connected with farm operation is emphasized.

2 class hours.

3 2-hour laboratory periods, credit, 5.

Mr. SAWTELLE.

80. **I. SEMINAR.** — For seniors and graduate students. Research in agricultural economics and history; problems of New England agriculture. Library work and reports. If desirable some other topic may be substituted. Hours to be arranged.

1 2-hour conference period, credit, 1 or 2.

The DEPARTMENT.

81. **II. SEMINAR.** — For seniors and graduate students. As stated in Course 80.

1 2-hour conference period, credit, 1 or 2.  
The DEPARTMENT.

82. **III. SEMINAR.** — For seniors and graduate students. As stated in Course 80.

1 2-hour conference period, credit, 1 or 2.  
The DEPARTMENT.

### Agricultural Education.

Professor HART, Professor WELLES, Mr. HEALD,<sup>1</sup> Miss HAMLIN.

The plan of the teacher-training courses is as follows: —

(a) **A TWO-YEAR TEACHER-TRAINING COURSE.** — Designed for mature persons of approved farm experience and educational advancement, who declare an intention to prepare for teaching in vocational agricultural schools or departments in Massachusetts. This course leads to a certificate of credit from the Massachusetts Department of Education. This certificate places the holder on the preferred list of candidates for teaching in vocational agricultural schools and departments. The course is under the joint guidance of the agent of the Massachusetts Department of Education and the Department of Agricultural Education. Each student's work is so planned that he may pursue with thoroughness the subjects in which his previous preparation may have been deficient. His program is planned with reference to his main objective, whether it is teaching agriculture or an allied subject.

(b) **A FOUR-YEAR COLLEGE COURSE.** — Entered under the usual entrance conditions. This leads to the degree of bachelor of science and to a teacher's certificate from the Massachusetts Department of Education. This certificate authorizes the holder to teach in a State-aided high school. The program for obtaining a teacher's certificate is planned under the supervision of the Department of Agricultural Education. The course also leads to a certificate of credit from the Massachusetts Department of Education, which places the holder on the preferred list of candidates for teaching in vocational agricultural schools and departments. Students are guided in the choice of courses for the certificate of credit by the Department's agent at the college. The program is carried out in accordance with a co-operative agreement between the Massachusetts Department of Education and the Massachusetts Agricultural College.

(c) **PROFESSIONAL IMPROVEMENT COURSE.** — Designed for teachers in service who seek improvement. Programs are planned strictly on the basis of individual needs, under the guidance of the agent of the Massachusetts Department of Education at the Massachusetts Agricultural College. In the prosecution of this program a student may enter courses given in the Summer School, in the Winter School, and in the four-year curriculum under the limitations of the schedule and his own qualifications to do the work. When the call seems to justify it, and subject to administrative and equipment limitations, special classes will be organized for carrying out this program. In the case of qualified persons, some of this work may be done in the Graduate School.

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<sup>1</sup> Representing the Massachusetts Department of Education in the administration of vocational education acts.

(d) **COURSES FOR PARTLY PREPARED CANDIDATES.** — Designed for supplementing the training of candidates whose qualifications are deficient in one or more particulars for teaching in vocational agricultural schools or departments. These programs may coincide in some cases with those in (a) or (c). They are planned under the guidance of the agent of the Massachusetts Department of Education in accordance with a co-operative agreement between the Department and the Massachusetts Agricultural College.

(e) **PRESCRIBED COURSES.** — Some study in the Department of Agricultural Education is required in all the foregoing programs. A minimum of 16 credit hours out of a total of 243 is required in those programs leading to a bachelor of science degree, to a teacher's certificate, or to a certificate of credit.

The equipment includes a combination classroom and laboratory for use in teaching agriculture in secondary schools. It is equipped with filing cases for records; cases for books and apparatus; a display-board for pictures, maps, charts, etc.; individual study desks; tables for supervised study; demonstration table supplied with sink, hot and cold water and gas, etc. The department office is equipped with books and pamphlets on agricultural education, properly catalogued.

25. **III. AGRICULTURAL OPPORTUNITIES FOR WOMEN.** — Sophomores. A course designed to show the woman who is interested in agriculture what opportunities there are for her in that field, and how she may best take advantage of them. The types of agricultural work for which women are best adapted will be discussed. A study will be made of some of the special problems which confront the woman farmer, and of her best ways of solving them. 2 class hours.

Credit, 2.

Miss HAMLIN.

#### *Elective Courses.*

50. **I. EDUCATIONAL PSYCHOLOGY.** — For juniors; sophomores and seniors may elect. Work planned primarily for candidates for teaching. Consists of a study of the mental growth and development, and some correlations of the mind and nervous system.

5 periods, credit, 5.

Professor HART.

51. **I, II and III. PRINCIPLES AND METHODS OF TEACHING.** — For juniors; seniors may elect. A study of the laws of learning, exhaustive inquiry into the meaning of interest, apperception, memory-images, judging and reasoning, and their applications in teaching processes, class management and organization of lesson plans.

5 periods, credit, 5.

Professor WELLES.

52. **III. HISTORY AND PHILOSOPHY OF EDUCATION.** — For juniors; seniors may elect. A study of educational history in modern times, educational movements in the United States and their bearing on national aims and ideals, with special emphasis on education for a democracy.

5 periods, credit, 5.

Professor WELLES.

75. **I. ORGANIZATION AND SUPERVISION OF SECONDARY EDUCATION.** — For seniors; juniors may elect. School systems, courses of study, training of teachers, financial support, recent tendencies and policies in secondary schools.

3 periods, credit, 3.  
Professor WELLES.

76. **I, II and III. SPECIAL METHODS IN VOCATIONAL AGRICULTURE.** — For seniors; juniors and others qualified may elect. Consists of the outlining of lessons, outlining of projects for agricultural teaching, and applications of the principles of vocational education as embodied in the Smith-Hughes Act, and other legislation relative to agricultural education.

3 periods, credit, 3.  
Professor WELLES.

77. **III. COUNTY AGENT WORK.** — For seniors. Work on special agricultural problems by individual students; preparation and presentation of a number of theses, using charts and other apparatus. Major advisers will be responsible for accuracy of subject-matter; the Department of Agricultural Education will be responsible for preparation and presentation.

5 periods, credit, 5.  
Professor HART.

80. **I, II, III and IV. TEACHER-TRAINING COURSE.** — For seniors and graduate students. Work will consist of supervised apprentice teaching accompanied by the arranging of subject-matter for lessons, the outlining of projects, and professional study. The number of credits will depend upon the number, character and length of teaching exercises and conferences. The work will be carried on in co-operation with the Massachusetts Department of Education.

Credits, 1 to 5.  
Professor WELLES.

90. **III. GENETIC PSYCHOLOGY.** — Primarily for seniors; juniors may elect. This course involves a study of the physical and mental growth and development of the individual from birth to maturity; a comparative study of the physiological and mental ages of children; and mental tests.

3 class hours.

Credit, 3.  
Professor HART.

91. **I. RURAL EDUCATION.** — Primarily for graduates; seniors may elect. A study of the development of the rural school; its organization and administration; its function for the community and for the individual; its place in the State system; some local surveys.

3 class hours.

Credit, 3.  
Professor HART.



### Rural Sociology.

Professor PHELAN, President BUTTERFIELD, Professor SIMS, Professor HART, Mr. NOVITSKY.<sup>1</sup>

The courses in rural sociology are designed for two purposes: first, to give students an appreciation of the general problems of country life; second, to afford a definite training for students who wish to take up some specific form of social service. In the last ten years rural sociology has been introduced as a subject into more than 50 per cent of the agricultural schools and colleges. There is a good demand for teachers, and an increasing opportunity in other directions in this subject. The courses afford the student an opportunity to pursue graduate as well as undergraduate work. The library of the college is unusually well equipped with rural sociological material.

#### *Required Course.*

27. **III. ELEMENTS OF RURAL SOCIOLOGY.** — Sophomores. A broad survey of the field of rural sociology, including such topics as the origin of rural sociology, its methods and problems; relation of sociological to the scientific and technical aspects of agricultural problems; the development of the rural community in New England and the west, religious, educational and social ideals of rural people; characteristics and influence of the rural environment, the movement of the rural population, the effects of immigration; rural institutions, the school, the church, local government, effects of modern conditions of life on rural institutions; rural organization; problems of progress, an analysis of the needs of rural life in its further development. Lectures, readings and essays on assigned topics.

3 class hours.

Credit, 3.

Professor SIMS.

#### *Elective Courses.*

50. **I. SOCIAL CONDITION OF RURAL PEOPLE.** — For juniors; seniors may elect. A. The rural status: composition of the rural population, nature, extent and causes of diseases and accidents, health agencies of control; extent and causes of rural delinquency and dependency, conditions of temperance, of sexual morality and family integrity; child labor, women's work and position; standard of living, size of family; cultural ideals; community consciousness and activity; standards of business conduct and of political ethics.

B. Rural social psychology: characteristics of the rural mind, character of hereditary and environmental influence; nature and effect of face-to-face groups; fashion, conventionality, custom, character of discussion and of public opinion.

3 class hours.

Credit, 3.

Professor SIMS.

51. **II. RURAL GOVERNMENT.** — For juniors; seniors may elect. A general survey of the development of rural government in the United States, origin of the New England town, its influence upon the west, advantages, development of efficiency, county government, the influence of the farmer in legislation, good roads movement, credit facilities, taxation, boards of agri-

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<sup>1</sup> On leave of absence.

culture, agricultural colleges and experiment stations in relation to rural welfare; national government; a general survey of political organizations and movements among farmers in the United States and foreign countries and their influence in shaping legislation; relation of the Department of Agriculture, postal system, the various national commissions and agencies to rural welfare. Lectures, readings, written exercises on assigned topics.

3 class hours.

Credit, 3.

Professor SIMS.

52. **III. RURAL ORGANIZATION.** — For juniors; seniors may elect. A study of the organized agencies by which rural communities carry on their various forms of associated life, particularly a study of the ways by which the domestic, economic, cultural, religious and political institutions contribute to rural betterment; principles underlying leadership, qualifications of the paid leader and the lay leader; the field of rural social service, national, State and local, preparation and opportunity for service; rural community building, a study of organized ways and means by which aid is given local communities. The method, scope and history of local, State and national associations formed about some farm product, their influence in forming class consciousness and in shaping agrarian legislation; need of federation. Lectures, readings and essays on assigned topics.

3 class hours.

Credit, 3.

President BUTTERFIELD.

76. **I. FIELD WORK IN RURAL SOCIOLOGY.** — For seniors; juniors may elect. This course is designed to meet the needs of students who wish to do some constructive work in rural social service while still in college. The work will be carried on in co-operation with the various college agencies engaged in rural service. Any project for which credit in this course is to be asked must first have the approval of the head of the department.

From 2 to 6 laboratory hours, credits, 1 to 3.

Professor PHELAN.

Prerequisites, Rural Sociology 27 and 52.

77. **II. RURAL SOCIAL SURVEYS.** — For seniors; juniors may elect. A careful study of the theory and function of statistics, the limitations and difficulties in the use of statistics, the interpretation of statistical data, various methods of graphic representation; a study of surveys, kinds and use, method of gaining information, the basis for conclusions, value of information gained. Text and lectures.

3 class hours.

Credit, 3.

Professor SIMS.

78. **II. RURAL AND BUSINESS LAW.** — For seniors; juniors may elect. The work of this course will cover such points as land, titles, public roads, rights incident to ownership of live stock, contracts, commercial paper and distinctions between personal and real property. Text, written exercises, lectures and class discussions.

5 class hours.

Credit, 5.

Professor HART.

79. **I. SEMINAR.** — Enrollment is limited to students who have had at least three courses in rural sociology, and to students majoring in the subject.

Credit, 1 to 3.

Professor PHELAN.

80. **II. SEMINAR.** — Enrollment is limited to students who have had at least three courses in rural sociology, and to students majoring in the subject.

Credit, 1 to 3.

Professor PHELAN.

81. **III. SEMINAR.** — Enrollment is limited to students who have had at least three courses in rural sociology, and to students majoring in the subject.

Credit, 1 to 3.

Professor PHELAN.

### **Rural Home Life.**

Miss SKINNER, Mrs. STRAHAN.

The Department of Rural Home Life offers elective courses for students majoring in other departments of the college. Fundamentally this training is such as will help young women to be better prepared to adjust themselves readily to their environment in the home and in the community, and to help them realize their responsibility as good homemakers and as good citizens. In addition to the elective courses indicated, courses in foods, clothing, business of the household and home care of the sick are offered to students in the two-year course in practical agriculture, and to students in the Ten Weeks' Winter School; and courses for teachers are offered in connection with the work of the Summer School.

The food laboratory, located in the entomology building, is fitted with individual desks (cabinet form) to hold utensils and materials for each student. Each table is equipped with gas stoves. A storage cabinet is provided with bins for supplies and cupboard space for large utensils and illustrative material. This room is well lighted and pleasant. The clothing laboratory is attractively located in French Hall. The equipment consists of sewing machines, cabinets, work tables, cutting tables, electric irons, dress forms and a collection of materials illustrating the production of textiles for clothing and household use.

#### *Required Courses.*

2. **II. INTRODUCTION TO HOME ECONOMICS.** — Freshmen women. A series of lectures concerned with the history and evolution of the home; social customs and their value in family relationships; healthful and suitable care of the wardrobe; principles of nutrition as applied to the student's life; the student's budget, and the keeping of personal accounts.

2 class hours.

Credit, 2.

Miss SKINNER.

3. **III. INTRODUCTION TO FOOD STUDY.** — Freshmen women. A study of the principles of the selection and preparation of food. Introductory to other food courses that are to follow. Spring term.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Miss SKINNER.

*Elective Courses.*

25. **I.** 26. **II.** 27. **III.** **TEXTILES AND CLOTHING.** — Sophomores. The selection and purchase of suitable materials, their character, cost and durability. Appropriateness and simplicity in dress. There will be practical work in hand and machine sewing, drafting and designing of patterns, the care and repair of clothing.

1 lecture.

2 2-hour laboratory periods, credit, 3.

Mrs. STRAHAN.

50. **I.** 51. **II.** 52. **III.** **FOODS AND COOKERY.** — Juniors. A course to establish a fundamental knowledge of foods. The lectures deal with a discussion of the comparative composition, cost and economic value of food-stuffs; their sources, production and manufacture. Laboratory practice in applying scientific principles to the selection and preparation of typical foods.

1 class hour.

2 2-hour laboratory periods, credit, 3.

Miss SKINNER.

75. **I.** 76. **II.** **HOUSEHOLD MANAGEMENT.** — Seniors. This course deals with the application of the principles of scientific management to the household, and the elements of successful home making. It includes a study of the family income, cost of living, household accounts, the budget and its apportionment. Consideration will also be given to the responsibility of the woman to her family and the community in establishing right standard of living.

2 class hours.

Credit, 2.

Miss SKINNER.

78. **III.** **HOME NURSING.** — Seniors. This course includes a study of the care of the family health; simple diseases and their prevention; the care of young children and invalids; first aid to the injured.

2 class hours.

Credit, 2.

Miss SKINNER.

## GENERAL DEPARTMENTS.

[Heavy-faced type indicates the term in which the course is given. Numbering of courses: 1 to 24, inclusive, freshmen; 25 to 49, inclusive, sophomores; 50 to 74, inclusive, juniors; 75 to 99, inclusive, seniors.]

### Military Science and Tactics.

Lieutenant-Colonel R. W. WALKER, Cavalry, U. S. A.; Major F. E. SHNYDER, Cavalry, U. S. A.; Technical Sergeant JOHN J. LEE, U. S. A., retired; First Sergeant WILLIAM A. BROWN, Cavalry, U. S. A.; Stable Sergeant WALTER D. COLLIER, Cavalry, U. S. A., and a detachment of enlisted men of the United States Army.

Under act of Congress (July 2, 1862) military instruction under a regular army officer was required in this college of all able-bodied male students. Under act of Congress June 3, 1916, as amended by act of Congress Sept. 8, 1916, there was established at this college in April, 1917, an infantry unit of the Reserve Officers' Training Corps. Following the World War and an act of Congress (July 9, 1918) the Reserve Officers' Training Corps is in operation under the regulation of the War Department, administered by the president of the college and the professor of military science and tactics.

The primary object of the R. O. T. C. is to provide systematic military training at civil educational institutions, for the purpose of qualifying selected students of such institutions as reserve officers in the military forces of the United States. It is intended to attain this object during the time the students are pursuing their general or professional studies, with the least practicable interference with their civil careers, by employing methods designed to fit men physically, mentally and morally for pursuits of peace as well as war.

All candidates for a degree in a four-year course must take for two years three hours a week of military training.

Students in their junior and senior years, who are approved by the president and the professor of military science and tactics, may take the advanced course if they so elect. The advanced course consists of five hours per week and a summer camp of about six weeks during the summer vacation, between the junior and senior years. Students taking this course are paid by the Federal government at a rate to be fixed by the Secretary of War, not to exceed the value of the army ration. The rate now fixed is 53 cents per day, which amounts to about \$190 per year. Students graduating in the advanced course are eligible for commissions in the Officers' Reserve Corps, *but are not required to accept such commissions if offered.*

The required uniform is of olive drab woolen cloth, and is furnished for the use of the students by the Federal government without cost. It is worn by all cadets when on military duty, and may be worn at other times. New uniforms are furnished each year.

Beginning with the fall term, 1920-21, there was established a cavalry unit of the R. O. T. C. This work should fit in well with the Departments of Animal Husbandry and Veterinary Science, besides affording students a recreational and physical exercise not usually found at educational institutions.

*Required Courses.*

1. **I. TACTICS.** — Freshmen. Theoretical instruction through the school of the trooper and squad. Lectures on military subjects.  
1 class hour.

Credit, 1.  
Lieutenant-Colonel WALKER.

2. **II. TACTICS.** — Freshmen. Theory of small-arms firing, minor tactics, guard duty, personal hygiene and first-aid.  
1 class hour.

Credit, 1.  
Lieutenant-Colonel WALKER.

3. **III. TACTICS.** — Freshmen. Theoretical instruction in cavalry drill regulations, dismounted. Lectures on military subjects.  
1 class hour.

Credit, 1.  
Lieutenant-Colonel WALKER.

4. **I. DRILL.** — Freshmen. Practical instruction in cavalry drill regulations, dismounted, schools of the trooper, squad and platoon, close and extended order.

2 laboratory hours.  
Credit, 1.  
Lieutenant-Colonel WALKER and Sergeants LEE and COLLIER.

5. **II. DRILL.** — Freshmen. Physical drill, position and aiming drills, gallery practice.

2 laboratory hours.  
Credit, 1.  
Lieutenant-Colonel WALKER and Sergeants LEE and COLLIER.

6. **III. DRILL.** — Freshmen. Practical instruction in cavalry drill, dismounted, marching, ceremonies and guard.

2 laboratory hours.  
Credit, 1.  
Lieutenant-Colonel WALKER and Sergeants LEE and COLLIER.

25. **I. TACTICS.** — Sophomores. Cavalry drill regulations, elementary topography and map reading. Lectures on military subjects.

1 class hour.  
Credit, 1.  
Lieutenant-Colonel WALKER.

26. **II. TACTICS.** — Sophomores. Theory of small arms firing and musketry, minor tactics, signaling.

1 class hour.  
Credit, 1.  
Lieutenant-Colonel WALKER.

27. **III. TACTICS.** — Sophomores. Theoretical instruction in cavalry drill regulations. Lectures on military subjects.

1 class hour.  
Credit, 1.  
Lieutenant-Colonel WALKER.

28. **I. DRILL.** — Sophomores. Practical instruction in cavalry drill regulations, schools of the trooper, platoon and troop, close and extended order, mounted and dismounted.  
2 laboratory hours.

Credit, 1.

Lieutenant-Colonel WALKER and Sergeant BROWN.

29. **II. DRILL.** — Sophomores. Physical drill, position and aiming drills, gallery practice, saber manual and exercises, pistol exercises.  
2 laboratory hours.

Credit, 1.

Lieutenant-Colonel WALKER and Sergeant BROWN.

30. **III. DRILL.** — Sophomores. Practical instruction in cavalry drill, marching, ceremonies, guard, range practice, rifle and pistol.  
2 laboratory hours.

Credit, 1.

Lieutenant-Colonel WALKER and Sergeant BROWN.

*Elective Courses.*

50. **I. MILITARY SCIENCE.** — Juniors. Topography, minor tactics, lectures, cavalry drill regulations, equitation.  
3 class hours.

Credit, 3.

Lieutenant-Colonel WALKER and Sergeant BROWN.

51. **II. MILITARY SCIENCE.** — Juniors. Law, common and military, minor tactics, lectures on military subjects, equitation. Automatic rifle and machine guns.  
3 class hours.

Credit, 3.

Lieutenant-Colonel WALKER and Sergeant BROWN.

52. **III. MILITARY SCIENCE.** — Juniors. Minor tactics, field engineering and equitation.  
3 class hours.

Credit, 3.

Lieutenant-Colonel WALKER and Sergeant BROWN.

53. **I. DRILL.** — Juniors. Duties consistent with rank as cadet officers or noncommissioned officers in connection with practical work laid down for the unit.  
2 laboratory hours.

Credit, 1.

Lieutenant-Colonel WALKER and Sergeants LEE, BROWN and COLLIER.

54. **II. DRILL.** — Juniors. As stated under Course 53.  
2 laboratory hours.

Credit, 1.

Lieutenant-Colonel WALKER and Sergeants LEE, BROWN and COLLIER.

55. **III. DRILL.** — Juniors. As stated under Course 53, automatic rifles, machine guns, dismounted pistol practice.  
2 laboratory hours.

Credit, 1.

Lieutenant-Colonel WALKER and Sergeants LEE, BROWN and COLLIER.

75. **I. MILITARY SCIENCE.** — Seniors. Advanced topography and the solution of map problems. Minor tactics, troop administration, hippology, cavalry drill regulations, equitation.  
3 class hours.

Credit, 3.

Lieutenant-Colonel WALKER and Sergeant BROWN.

76. **II. MILITARY SCIENCE.** — Seniors. Military law, military policy of the United States, minor tactics. Lectures on military subjects, equitation.  
3 class hours.

Credit, 3.

Lieutenant-Colonel WALKER and Sergeant BROWN.

77. **III. MILITARY SCIENCE.** — Seniors. Tactical rides, military history of the United States, field engineering, equitation.  
3 class hours.

Credit, 3.

Lieutenant-Colonel WALKER and Sergeant BROWN.

78. **I. DRILL.** — Seniors. As stated under Course 53.  
2 laboratory hours.

Credit, 1.

Lieutenant-Colonel WALKER and Sergeants LEE, BROWN and COLLIER.

79. **II. DRILL.** — Seniors. As stated under Course 53.  
2 laboratory hours.

Credit, 1.

Lieutenant-Colonel WALKER and Sergeants LEE, BROWN and COLLIER.

80. **III. DRILL.** — Seniors. As stated under Course 53. Automatic rifle, machine guns, mounted pistol practice.  
2 laboratory hours.

Credit, 1.

Lieutenant-Colonel WALKER and Sergeants LEE, BROWN and COLLIER.

### Physical Education and Hygiene.

Professor HICKS, Assistant Professor GORE, Mrs. HICKS, Mr. GRAYSON, Mr. JAKEMAN.

The purpose of the courses offered by this department is to provide active exercise and to instruct every student how to care for his health and maintain his physical condition while carrying on his college course.

The equipment consists of the Alumni Athletic Field, which has room for two football fields, a quarter-mile cinder track with a 220 straightaway, and the baseball diamond; and also the old field for class football and baseball, two tennis courts, and the drill hall floor for basket-ball. For several years the drill hall floor was used for class work in gymnastics, but its condition has become so bad that this has been discontinued. During the winter months a hockey rink is provided on the college pond.

[All classified undergraduate male students are given a physical examination upon entering.]

### MEN.

#### *Required Courses.*

1. **I. HYGIENE.** — Freshmen. Lectures on personal hygiene.  
1 class hour.

Credit, 1.

Professor HICKS.



2. **I. RECREATION.** — Freshmen. Outdoor games.  
1 laboratory hour. Credit, third term.  
Mr. GRAYSON.

3. **III. RECREATION.** — Freshmen. Outdoor games.  
1 laboratory hour. Credit for Nos. 2 and 3, 1.  
Mr. GRAYSON.

25. **I. RECREATION.** — Sophomores. Outdoor games.  
1 laboratory hour. Credit, third term.  
Mr. JAKEMAN.

26. **III. RECREATION.** — Sophomores. Outdoor games.  
1 laboratory hour. Credit for Nos. 25 and 26, 1  
Mr. JAKEMAN.

*Elective Course.*

77. **III. TRAINING COURSE.** — Seniors. Election by permission only.  
History of physical education and supervision of athletics.  
1 class hour. Credit, 1.  
Professor HICKS.

WOMEN.

*Required Courses.*

4. **I. RECREATION.** — Freshmen. Outdoor games.  
3 laboratory hours. Credit, 1.  
Mrs. HICKS.

5. **II. GYMNASTICS.** — Freshmen. Dancing, Swedish games, etc.  
3 laboratory hours. Credit, 1.  
Mrs. HICKS.

6. **III. RECREATION.** — Freshmen. Outdoor games.  
3 laboratory hours. Credit, 1.  
Mrs. HICKS.

27. **I. RECREATION.** — Sophomores. Outdoor games.  
3 laboratory hours. Credit, 1.  
Mrs. HICKS.

28. **II. GYMNASTICS.** — Sophomores. Dancing, Swedish games, etc.  
3 laboratory hours. Credit, 1.  
Mrs. HICKS.

29. **III. RECREATION.** — Sophomores. Outdoor games.  
3 laboratory hours. Credit, 1.  
Mrs. HICKS.

*Elective Courses.*

50. **II. GYMNASTICS.** — Juniors. Dancing, Swedish games, etc.  
3 laboratory hours. Credit, 1.  
Mrs. HICKS.

76. **II. GYMNASTICS.** — Seniors. Dancing, Swedish games, etc.  
3 laboratory hours. Credit, 1.  
Mrs. HICKS.

### THE LIBRARY.

The library — stack room, reading room and office — occupies the entire Chapel building. It contains about 65,000 catalogued volumes, several thousand volumes not catalogued, and a large number of bulletins, farm papers and other material, which is being put into good working order as fast as possible. Works on agriculture, horticulture, botany, entomology and the various sciences predominate, but literature, history and sociology are well represented and receive due attention. The reading room provides a good variety of popular and technical periodical literature, encyclopedias and general reference books.

The library is being reclassified and recatalogued in order to make the splendid material accessible and of the greatest working value. Every effort is being made toward developing the college library into a vital intellectual center, of equal value to every student, teacher and teaching department on the college campus. Consequently only the most cordial relations are cherished, and the fewest and most imperative rules concerning the circulation of books and deportment are enforced. An agricultural reference library is maintained in Stockbridge Hall, and department libraries are also maintained in some of the other buildings on the campus.

Occasional lectures are given to regular and short-course students in order to make the best use of the library equipment. Emphasis is laid upon the card catalogue, periodical indexes, bibliographies and guides, and the large collections of United States Department of Agriculture and experiment station literature.

Library hours are from 8 A.M. to 9.30 P.M. every week day, and from 9 A.M. to 1.30 P.M. on Sundays in term time. Shorter hours prevail during vacation.

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# THE GRADUATE SCHOOL

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# THE GRADUATE SCHOOL.

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KENYON L. BUTTERFIELD, A.M., LL.D., President of the College.

CHARLES H. FERNALD, Ph.D., Honorary Director of the Graduate School.

CHARLES E. MARSHALL, Ph.D., Director of the Graduate School and Professor of Microbiology.

## GRADUATE STAFF, 1918-19.

Professor BEAUMONT, Professor CANCE, Professor CHAMBERLAIN, Assistant Professor O. L. CLARK, Professor CRAMPTON, Professor FERNALD, Professor FOORD, Professor GRAHAM, Assistant Professor ITANO, Professor LINDSEY, Professor OSMUN, Professor PETERS, Professor PHELAN, Professor SEARS, Professor WAUGH, Director MARSHALL, President BUTTERFIELD; Mr. WATTS, Secretary.

Graduate courses leading to the degrees of master of science and doctor of philosophy have been given for a number of years; the degrees of master of agriculture and doctor of agriculture are now granted to meet strictly professional needs. The number of requests for each of these courses is apparently increasing. In recognition of the benefits to be derived from a separate organization, a distinct graduate school has been established for the purpose of fitting graduates of this and other institutions for teaching in colleges, high schools and other public schools; for positions as government, State and experiment-station specialists in farm management, dairying, live-stock husbandry, poultry science, agronomy, landscape gardening, pomology, vegetable gardening and floriculture; for positions as bacteriologists, botanists, chemists, entomologists; and for numerous other positions requiring a great amount of scientific and professional knowledge, training and experience.

## ORGANIZATION.

The school is based upon the department as the unit, and the apprenticeship system as the most effective means of instruction. This gives to the student individuality in treatment and an intimacy with actual conditions of work and operations. Besides, each student is assigned to an advisory committee, composed of the instructor in charge of his major subject as chairman, and instructors in charge of his minor subjects as members, which directs his graduate studies. The chairmen of all these committees together constitute the graduate staff, which controls the policy of the graduate school.

## ADMISSION.

Admission to the graduate school will be granted:—

1. To graduates of the Massachusetts Agricultural College.
2. To graduates of other institutions of good standing who have received a bachelor's degree substantially equivalent to that conferred by this college.

In case an applicant presents his diploma from an institution of good standing, but has not, as an undergraduate, taken as much of the subject he selects

for his major as is required of undergraduates at the Massachusetts Agricultural College, he will be required to make up such parts of the undergraduate work in that subject as the instructor in charge may consider necessary. He shall do this without credit toward his advanced degree.

Admission to the graduate school does not necessarily admit to candidacy for an advanced degree, — students holding a bachelor's degree being in some cases permitted to take graduate work without becoming candidates for higher degrees.

Applications for membership in the graduate school should be presented to the director of the school. Full statements of the applicant's previous training, of the graduate work desired, and of the amount and kind of work already done by him as an undergraduate should be submitted, together with a statement whether the applicant desires to work for a degree.

Registration is required of all students taking graduate courses, the first registration being permitted only after the student has received an authorization card from the director.

#### NATURE, METHODS AND REQUIREMENTS OF GRADUATE WORK.

Graduate work differs from undergraduate work in its purposes and methods. The primary aims of the instructor are emphasized in an attempt to have the student adjust himself and place himself in his environment; develop the rule of self-direction and self-instruction; acquire the power of accurate reasoning; gain proficiency and skill in his selected field of study or practice; and obtain an appreciative and discriminative insight into experimentation and original research. Methods are not devised, therefore, for attractiveness, entertainment and superficial reviews, but for the creation of initiative and profound thought, thorough acquaintance with detail, independent advance and industrious habits. Careful readings, lectures, conferences, surveys, laboratory exercises and field work are some of the agencies utilized.

All members of the graduate school are required to attend the course of lectures designed to supplement the technical work of all graduate studies. These lectures will be given once each week, and the students will be held responsible for the work. [Suspended during continuance of the war.]

Candidates for the degree of master of science are required to prosecute two subjects, one of which shall be designated as a major and the other as a minor. These subjects may not be selected in the same department. An original thesis is considered a part of the major subject.

Candidates for the degree of doctor of philosophy are required to prosecute three subjects, one of which shall be designated as the major and the others as minors. No two of these subjects may be taken in the same department. An original thesis shall be considered a part of the major subject.

Candidates for the degree of master of agriculture are allowed greater privileges in the selection of subjects, but will be required to select a major and such other supporting lines of study as will be necessary properly to equip the individual professionally.

Candidates for the degree of doctor of agriculture are required to select a major and such other subjects as will develop the major in its greatest intensity and comprehensiveness. Successful experience is also requisite, together with a thesis which represents a masterly survey or intimate study through accurate application of some phase of the major subject.

Candidates for the degree of master of landscape architecture will be expected to conform to the established courses of the department, and to the requirements of the department in the preparation of a thesis, as well as in actual experience outside the college.

Candidates for membership in the graduate school who do not desire to work for a degree may, with the approval of the director of the school, take more than one subject in the same department, or pursue work in several departments, if their preparation will permit. A statement of the subjects chosen must in each case be submitted to the director of the graduate school for approval by the student's advisory committee. The chosen subjects must bear an appropriate relation to each other.

A working knowledge of French and German is essential to successful graduate work, and students not having this will find it necessary to acquire it as soon as possible after entering.

The graduate staff reserves the privilege of recommending and allowing courses in other institutions as a part of residence instruction. Such supervision will be exercised and credit granted as are essential to the highest standards of efficiency.

#### THESES.

A thesis is required of each candidate for an advanced degree. It must be on a topic belonging to the candidate's major subject; must show that its writer possesses the ability to carry on original study; and must be an actual contribution to knowledge.

The thesis in its final form must be submitted to the director by May 15 of the year in which the student is to present himself for the advanced degree, and before he may take the required examination. Three complete copies are required. One of the said copies is to be retained as an official copy by the said director, one is to be deposited in the college library, and the third is to be retained by the department in which the thesis was prepared. The candidate for the doctor's degree must be prepared to defend at the oral examination the views presented in his thesis.

#### FINAL EXAMINATIONS.

For the degree of master of science, master of agriculture, or master of landscape architecture, final examination, which may be either written or oral, or both, is given upon the completion of each subject.

For the degrees of doctor of philosophy and doctor of agriculture, final examinations on the minors taken are given upon the completion of the subjects. In the major subject, a written examination, if successfully passed, is followed by an oral examination in the presence of the faculty of the school.

#### DEGREES CONFERRED.

The degrees of master of science, master of agriculture and master of landscape architecture are conferred upon graduate students who have met the following requirements: —

1. The devotion of at least one year and a half<sup>1</sup> to the prosecution of study in two subjects of study and research, not less than one full college year of which must be in residence. In the case of a master of landscape architecture the student must follow the prescribed course of study.

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<sup>1</sup> All time statements refer to minimum time.

2. The earning of not less than fifty credits in the chief or major subject, and of not less than twenty-five credits in the minor subject. Students pursuing the course in landscape architecture will devote all of their time to the established course, and meet the conditions of one year of experience outside the college.

3. The preparation of a thesis in the major subject, constituting an actual contribution to knowledge, and accompanied by drawings if necessary.

4. The passing of final examinations, in both major and minor subjects, to the satisfaction of the professors in charge.

5. The payment of all fees and college expenses required.

The degrees of doctor of philosophy and doctor of agriculture are conferred upon graduate students who have met the following requirements:—

1. The devotion of at least three years to the prosecution of three subjects of study and research in residence at the college.

2. The earning of not less than one hundred credits in the chief or major subject, and of not less than twenty-five credits in each of two minor subjects.

3. The preparation of a thesis, in the major subject, constituting an actual contribution to knowledge and accompanied by drawings if necessary. For the degree of doctor of agriculture the thesis may be modified to meet professional requirements.

4. The passing of final examinations, in both the major and minor subjects, to the satisfaction of the instructors in charge.

5. The payment of all fees and college expenses required.

The fee for the degree of master of science, master of agriculture, or master of landscape architecture is \$10, and for the degree of doctor of philosophy or doctor of agriculture, \$25.

#### COURSES OFFERED.

Courses available as major subjects for the degree of doctor of philosophy:—

Agricultural economics.  
Botany.  
Chemistry.  
Entomology.

Horticulture.  
Microbiology.  
Rural sociology.

Courses available as major subjects for the degree of master of science:—

Agricultural economics.  
Agricultural education.  
Agriculture.  
Agronomy.  
Animal husbandry.  
Botany.  
Chemistry.

Entomology.  
Horticulture.  
Mathematics and physics.  
Microbiology.  
Poultry science.  
Rural sociology.  
Veterinary science.

Courses available as major subjects for the degree of master of agriculture:—

Agronomy.

Animal husbandry.

Poultry science.

The course in landscape architecture leads to the degree of master of landscape architecture.



Courses available as minor subjects:—

Agricultural economics.  
Agricultural education.  
Agriculture.  
Agronomy.  
Animal husbandry.  
Animal pathology.  
Botany.  
Chemistry.

Entomology.  
Horticulture.  
Landscape architecture.  
Mathematics and physics.  
Microbiology.  
Poultry science.  
Rural sociology.  
Zoölogy.

#### GENERAL OUTLINE OF COURSES FOR ADVANCED DEGREES.

**Agricultural Economics** (Major Course).—1. Graduate research work in agricultural economics will be developed by four principal methods, namely, historical, statistical, accounting and general field investigation. In all instances the method includes facility in investigation, tabulation and interpretation of results.

2. Candidates for the doctorate, the master's degree, or candidates offering a minor in agricultural economics, will be required to pass an examination covering the undergraduate work now offered in agricultural economics, including Course 50, the elements of economics, Course 75, the agricultural market and Course 52, co-operation in agriculture; and in addition such definite research work as may be outlined by the department, to consist of original investigations in some particular divisions of the subject of agricultural economics. Courses 52, 53, 76, 77, 78 and 79 are for graduates and undergraduates. Special investigations may be made by electing seminars 80-82 in agricultural economics.

3. Candidates for the doctor's degree will be required to write a thesis, and candidates for the master's degree a thesis or a report, covering results of a specific line of personal investigation in one or more fields of the subject. Each candidate will also be required to have a working knowledge of the general field of economics, the theory of agricultural economics, the problems of agricultural production, land tenure, land problems, agricultural commerce, agricultural co-operation, agricultural credit, statistics of agriculture and prices, and markets and marketing.

**Agricultural Education.**—Work offered in this department may be taken as a major or minor for the degree of master of science or as a minor for the degree of doctor of philosophy or master of science. Three lines of study are open to students who are properly qualified,—agricultural education, public school supervision, and the philosophy of education. In order to enter upon any one of these for credit towards an advanced degree the candidate must present evidence of proficiency in at least five courses in agricultural education as outlined for undergraduates, or their equivalent. Open only to persons holding a bachelor of science degree from this college or its equivalent; also to school superintendents, principals and to teachers of successful experience and of mature years, who have the above preparation and who wish to avail themselves of this opportunity for advanced study even though not candidates for a degree.

**Agronomy** (Master of Science).—Graduate students desirous of taking major work in agronomy should have had a good training in the fundamentals of the natural sciences, since agronomical problems involve the application of the natural sciences especially. They should have taken Agronomy

27 and 50, or their equivalents, and other courses given by this department along the line of the problem on which they will work, and should have a command of the laboratory technique required for their problems. Problems may be chosen in which particular attention is devoted to soils, fertilizers or field crops. The specific problem is selected in conference with the major adviser, consideration being given to the student's desires and abilities.

Although this department does not attempt to limit the field of research in agronomy, the following phases are suggested to the prospective graduate student:—

I. SOILS AND FERTILIZERS. — (a) Soil physics: Textural relationships of soil classes; adsorption phenomena; physical properties in relation to mineralogical and chemical properties; soil structure; moisture relationships; the colloidal conditions of soils, etc.

(b) Soil chemistry: Nitrogen fertilization, including commercial supply and gain or loss under different systems of soil management; absorption of potash and phosphoric acid; sulfur fertilization; soil acidity, etc.

(c) Soil biology: Fixation of nitrogen by symbiotic and nonsymbiotic organisms; changes of green and animal manures in the soil, — ammonification and nitrification; care and preservation of manures; humus in relation to soil fertility, etc.

II. FIELD CROPS. — (a) Varieties: Classification; adaptation to climatic and soil conditions, etc.

(b) Distribution as affected by natural and economic conditions.

(c) Cultural methods: Early and late planting of the potato seed crop, of silage corn; spacing of plants; keeping qualities as affected by time and methods of harvesting; tillage and moisture control, etc.

(d) Storage of cereals, roots and tubers as affected by aeration, temperature, humidity, previous treatment, etc.

(e) Crop improvement, involving the application of the principles of plant-breeding to special crops.

After the selection of a topic for investigation the student is required to formulate the problem in detail, develop a line of attack, carry on the work and present the results in a thesis acceptable to the staff of the Graduate School. The student is required to familiarize himself with the literature bearing on the subject.

A graduate student taking a minor in this department will be required first to take certain of the regular courses offered by the department, unless he has already had them or their equivalents. The work assigned will then depend somewhat on the time required to complete these courses.

It is the aim of the department to supply laboratory, greenhouse and field facilities for attacking agronomical problems through most of the known means. These facilities are intended primarily for the use of graduate students doing major work in agronomy, but others will be allowed to use them when circumstances permit.

**Animal Husbandry** (Master of Science). — **COURSE A. ANIMAL BREEDING.** — 1. Reading: Thorough survey of the scientific works dealing with plant and animal breeding and improvement.

2. Project: Each student must outline and pursue some Mendelian problem.

3. Thesis: This is to be a complete treatise of the problem which the student undertakes; it should be a valuable contribution to the present knowledge of the question of animal breeding.

**COURSE B. ANIMAL NUTRITION.** — This course is in outline similar to A. It is designed to cover the field of nutrition, feeding and management of live stock.

**Seminar:** Regular periods will be devoted to a discussion of the projects undertaken, together with criticisms of the available material on the question pursued.

**Object.** — To give the student a comprehensive knowledge of feeding, breeding and management of live stock. This may be divided into a major and a minor, in order to give the student the opportunity of devoting a proportionate share of his time to the class of live stock in which he is particularly interested.

**Reading.** — The student is to make a very complete survey of experimental and periodical literature dealing with the various phases of the subject.

**Practice.** — Before the completion of the work for the degree, the student must have the equivalent of at least one year's continuous work on an approved live-stock farm.

**Seminar:** Regular periods to discuss progress of the work.

**Animal Pathology** (Minor Course only). — 1. Reviews in anatomy.

2. Reviews in organography and histology.

3. Special lectures and readings in general and special pathology.

4. Laboratory studies in general and special pathology.

5. Pathological technique.

6. Conferences.

**Botany** (Major Courses). — The equivalent of certain undergraduate courses, determined in the case of each student by the department, is prerequisite. Candidates for the degree of master of science are required to pass a final examination in writing. A final examination in writing before the department and an oral examination before the graduate staff must be passed by candidates for the degree of doctor of philosophy. Candidates for the latter degree are required to attend all graduate lectures given by the department. Candidates for the degree of master of science will take those lectures given during their period of study in the department. All lecture courses will be given in rotation, except Courses 1 and 2, which will come every year. There will be three lectures a week throughout the fall, winter and spring terms. These lecture courses, outlined below, are designed to cover a period of three years.

1. **PLANT PHYSIOLOGY.** — The lectures will consider, under the nutrition of the plant: its chemical structure, absorption of various nutrient substances and their changes in the plant, assimilation and dissimilation of carbon and nitrogen by autotrophic and heterotrophic plants; under changes in the form of plants: growth and form under constant external factors, the influence of variable external and inner factors on growth, form and development; and under plant movements: the various tropisms, nutations, etc. Supplemental demonstrations, laboratory work and readings in the standard texts and journals. One lecture a week for 36 weeks.

2. **PLANT PATHOLOGY.** — A general consideration of the history, nature and causes of plant disease; parasitism, predisposition, immunity, degeneration, natural and artificial infection, dissemination, epidemics, biologic strains, monstrosities and malformations, proliferation, prevention and control, economics of plant diseases. One lecture a week for 36 weeks.

3. **NORMAL AND PATHOGENIC METABOLISM.** — The lectures in this subject embrace, in more or less detail, comparative consideration of the metabolism

of the host in health and disease; the metabolism of the parasite under varying conditions; enzyme activities in host and parasite; methods of preparation and determination of enzyme activities; chemical and physical changes induced in plant tissue by parasites; immunity, etc. Current investigations and new phases of the subjects under discussion will also receive attention as they appear. One hour a week for 24 weeks.

4. THE COMPARATIVE ANATOMY OF GREEN PLANTS. — In these lectures an intensive study is directed to the comparative anatomy of green plants from the evolutionary standpoint. Particular emphasis is laid upon the woody forms both living and extinct. Of the latter the department is fortunate in possessing excellent sets of micro-preparations and lantern slides. Two lectures and one laboratory period for 24 weeks.

5. BIOLOGIC RELATIONS. — Consideration of certain phases of the morphological and physiological adaptations of plants with regard to insect visit; the rôle of thorns, hairs, tendrils, glands, etc. Various experiments will be made to test out experimentally some of the existing theories concerning biologic adaptations. One lecture a week for 12 weeks.

6. THE ECOLOGY OF PLANTS. — This course deals with the water, light and temperature relations of plants, and the various adaptations in response to these factors; the various types of plant formation; the migration of plants; the competition of plants; invasion and successions of plants under varied conditions; and the various types of alternations and zonations. One lecture a week for 12 weeks.

7. PHYSIOLOGICAL PLANT PATHOLOGY. — This course considers those plant diseases not due to bacterial or fungous parasites, but resulting from unfavorable physical or chemical conditions of the soil; from harmful atmospheric influences, such as too dry air, too much moisture, hail, wind, lightning, frost; from injurious gases and liquids; from lack of or too much light; from wounds. A knowledge of the normal physiology of the plant is required. Demonstrations and laboratory work will be given, together with assigned readings. One lecture a week for 12 weeks.

8. HISTORY OF BOTANY. — A historical survey of the science; lives of noted botanists; history of certain culture plants, such as wheat, corn, coffee, potato, rice, and their influence on civilization; reading. One lecture a week for 18 weeks.

Seminar: A weekly seminar for members of the department staff, graduate students and major senior students is held, at which important current botanical papers are discussed. Attendance and participation are required.

Collateral Reading: Extensive reading of botanical literature in English, German and French, designed to give the student a broad knowledge of the science, is required of all major students. Final examinations are based in part upon this reading course.

Thesis: Each major student is required to select a problem in plant pathology or physiology (in other branches at the discretion of the department) for original investigation, and the thesis must embody a distinct contribution to knowledge. An effort will be made to assign problems having some bearing on scientific and economic agriculture.

Minor Course. — For a minor a student may take such of the work offered by the department as seems best suited to his major course. In most cases no problem will be assigned.

Professor OSMUN, Dr. CHAPMAN, Professor ANDERSON,  
Assistant Professor CLARK and Dr. TORREY.

**Chemistry.** — I. Major courses for the degree of master of science. Students will be required to take Courses 101, 108 to 114. In addition to this the requirements in the various thesis subjects are: —

**ORGANIC AND BIO-CHEMISTRY.** — Courses 115 and either 105, 106 or 107, and 6 hours for one term selected from Courses 103 (*b*) and (*f*), and 104.

**ANALYTICAL AND INDUSTRIAL AGRICULTURAL CHEMISTRY.** — Courses 116, 103 (6 hours), and 6 hours for one term selected from Courses 102, 104 to 107.

**PHYSICAL CHEMISTRY.** — Courses 104, 117, and 6 hours for one term selected from Courses 102, 103, 105 to 107.

**AGRICULTURAL CHEMISTRY.** — Courses 103 (6 hours), 118, and 6 hours for one term selected from Courses 102, 104 to 107.

The candidate must pass a final written and oral examination before the Department of Chemistry upon undergraduate Courses 1 to 80, inclusive, and upon all graduate work taken in chemistry by him.

II. Major course for the degree of doctor of philosophy. Students will be required to take Courses 101 to 114, and one course selected from 115 to 118. In addition, the student may be required to spend at least two terms or one semester at some other recognized institution pursuing graduate work in chemistry. The candidate must pass a final written examination before the Department of Chemistry, and an oral examination before the graduate staff, upon the whole field of chemistry, and must be especially well prepared in the lines of work covered by his research.

III. Minor course for the degrees of master of science and doctor of philosophy. Students will be required to take work totaling at least 25 credits. This may be selected from any of the undergraduate Courses 27 and 51 to 80, or any of the graduate courses for which the student is prepared. In addition, the candidate must pass a final written and oral examination before the Department of Chemistry upon the courses taken and upon undergraduate Courses 27 and 51 to 80.

The following is a list of the courses: —

**101. INORGANIC PREPARATIONS.** — Laboratory. The preparation of chemical products from raw materials. The manufacture and testing of pure chemicals. The laboratory work is essentially synthetic in nature, and is designed to aid in acquiring a more adequate knowledge of inorganic chemistry than is to be obtained by chemical analysis alone. Ten to fifteen of the preparations given in Biltz's "Laboratory Methods of Inorganic Preparations" will be made by each student. Any term, 6 hours.

Assistant Professor SEREX.

**102. ADVANCED INORGANIC PREPARATIONS.** — Laboratory. Continuation of Course 101. Any term, 6 hours.

Assistant Professor SEREX.

**103. ADVANCED ANALYTICAL CHEMISTRY.** — Laboratory. This course may be taken in part as follows: (*a*) electrolytic analysis, 6 hours; (*b*) ultimate analysis, 6 hours; (*c*) special analytical work to meet the needs of the individual student, 6 hours. In addition, parts of undergraduate Courses 62, 76 and 77 may be taken, as follows: (*d*) fertilizers, 6 hours; (*e*) insecticides, 6 hours; (*f*) milk and butter, 6 hours. (*a*), (*b*), (*c*) may be taken any time; (*d*), (*e*), (*f*) must be taken at the time the undergraduate course is given.

Professors WELLINGTON and PETERS.

104. ADVANCED PHYSICAL CHEMISTRY. — Laboratory. Measurement of the electrical conductivity of solutions; degree of ionization; ionization constants; per cent hydrolysis of aniline hydrochloride from conductivity measurements; solubility product by the conductivity method; velocity of saponification by conductivity; neutralization point by conductivity; vapor pressure determinations; critical temperature of carbon dioxide or sulphur dioxide; transport numbers; preparation and properties of colloidal solutions; transition points by dilatometric method; heat of solution of ammonium chloride and potassium nitrate; adsorption of iodine by charcoal; splitting of racemic glycerinic or racemic tartaric acids into their optical components. To each student separate work will be assigned. Any term, 6 hours.

Assistant Professor SEREX.

105. ADVANCED ORGANIC PREPARATIONS. — Laboratory. The preparation of compounds not included in Courses 51 and 52, such as the Kolbe synthesis of salicylic acid; benzophenone and Beckmann's rearrangement; rosaniline, malachite green, congo red, indigo and other dyes; synthesis of fructose; Grignard reaction. Barnett, Cain and Thorpe, Gatterman, Noyes, Fischer and other laboratory guides are used. To each student separate work will be assigned. Any term, 6 hours.

Professor CHAMBERLAIN.

106. ADVANCED BIO-CHEMISTRY. — Laboratory. The hydrolysis of proteins and isolation of the amino acids; the study of milk, blood and urine; dietary and digestion studies. References: Abderhalden, Plimmer, Sal-kowski, Hawk, etc. To each student separate work will be assigned. Any term, 6 hours.

Professor CHAMBERLAIN.

107. INDUSTRIAL ORGANIC CHEMISTRY. — Laboratory. The preparation, on a large scale, of wood alcohol, acetic acid, ethyl alcohol, benzene and cellulose products, such as mercerized cotton and artificial silk. References: Molinari, Rodgers and Aubert, Thorpe, Enzyklopädie der tech. Chemie, etc. To each student separate work will be assigned. Any term, 6 hours.

Professor CHAMBERLAIN.

108. THEORETICAL CHEMISTRY. — Lectures. The following topics are considered: the compressibility of the atoms; the structure of atoms; the electron conception of valence. First term, 1 hour. Alternates with Course 109.

Professor PETERS.

109. ANALYTICAL CHEMISTRY. — A general survey of methods and technique covering processes commonly carried out in the laboratory. Gooch's Quantitative Analysis is used as a text. First term, 1 hour. Alternates with Course 108.

Professor PETERS.

110. ORGANIC CHEMISTRY. — Lectures. Some of the following topics will be considered both theoretically and industrially: alkaloids, synthetic dyes, essential oils, terpenes, rubber, etc.; the study of methods for carrying out general reactions; isomerism, tautomerism, condensation, etc. References,

Cain & Thorpe, Cohen, chemical monographs, Lassar-Cohn, Heinrichs, Molinari. Second term, 1 hour. Given in 1916-17. Alternates with Course 111.

Professor CHAMBERLAIN.

111. BIO-CHEMISTRY. — Lectures. Some of the following topics will be considered both chemically and physiologically: fats, cholesterol, lecithin, carbohydrates, amino acids, proteins, urea, uric acid, purine bases, enzymes, fermentation, animal food and nutrition, photosynthesis. References, Monographs on Bio-Chemistry, Abderhalden, Plimmer, Haas & Hill, Lewkowitsch, Fischer, Euler, Mathews, Czapek. Second term, 1 hour. Given in 1917-18. Alternates with Course 110.

Professor CHAMBERLAIN.

112. THEORETICAL AND PHYSICAL CHEMISTRY. — Lectures. The relation between the constitution and properties of compounds; mutarotation; steric hindrances; stereoisomerism of other elements than carbon; molecular association; similarity between the compounds of silicon and carbon. Third term, 1 hour. Given in 1917-18. Alternates with Course 113.

Assistant Professor SEREX.

113. THEORETICAL AND PHYSICAL CHEMISTRY. — Lectures. Radioactivity; the application of physical chemistry to industrial chemistry. Third term, 1 hour. Given in 1916-17. Alternates with 112.

Assistant Professor SEREX.

114. SEMINAR. — Conferences, reports or lectures. Three terms, twice a month, 1½ hours.

Professor LINDSEY.

115. RESEARCH IN ORGANIC AND BIO-CHEMISTRY. — Three terms. A minimum of 20 hours' laboratory work per week. Credit determined by amount of work done.

Professor CHAMBERLAIN.

116. RESEARCH IN ANALYTICAL OR AGRICULTURAL INDUSTRIAL CHEMISTRY. — Three terms. A minimum of 20 hours' laboratory work per week. Credit determined by the amount of work done.

Professor WELLINGTON and Professor PETERS.

117. RESEARCH IN PHYSICAL CHEMISTRY. — Three terms. A minimum of 20 hours' laboratory work per week. Credit determined by amount of work done.

Assistant Professor SEREX.

118. RESEARCH IN AGRICULTURAL CHEMISTRY. — Three terms. A minimum of 20 hours' laboratory work per week. Credit determined by amount of work done.

Professor LINDSEY and EXPERIMENT STATION ASSOCIATES.

**Entomology.**—I. MAJOR COURSES for the degree of doctor of philosophy. Students must have had the undergraduate courses in entomology given at this college, or their equivalent. If deficient in any, opportunities to obtain them while taking the graduate work are available.

The graduate courses consist of lectures on all, and laboratory work on a part, of the subjects given below, together with advanced readings, seminar work and original research.

1. MORPHOLOGY.—The embryonic development of insects, including polyembryony; metamorphosis and its interpretations; advanced studies on external and internal anatomy and histology; the ancestry and development of insects, including fossil forms; hermaphrodites; hybrids; parthenogenesis, pedogenesis and heterogeny; the chemistry and physics of insect colors; color patterns, their significance and value; light production in insects; deformities; variation.

2. ECOLOGY.—Dimorphism and polymorphism, seasonal and sexual; mimicry, concealment, protective devices and warning coloration; architecture of insect constructions; the fertilization of plants by insects and its importance; insect products of value to man; the geographical distribution and methods of distribution of insects, including a consideration of life zones, barriers, etc.; insect migrations; the relation of insects to disease (advanced course); duration of life; experimental entomology on insect behavior.

3. ECONOMIC.—Control methods; insect photography and methods of preparing illustrations for the press; field work and life history investigations, with ways of keeping records of these; legislation about insects; tests of insecticides and of their application.

4. SYSTEMATIC.—The history of entomology; the rules of nomenclature and how they are applied; how to find the literature of the subject and how to use it; the abundance of insects; important collections, their location, value to the entomologist, their types and their condition; lives and work of prominent entomologists; methods for collecting, preparing, preserving and shipping insects.

5. SEMINAR.—Readings and reports on the current literature on entomology are held monthly.

6. COLLATERAL READINGS.—The best articles on the topics above and on the different groups of insects are assigned for collateral reading.

7. THESIS.—Original research on one or several topics in morphology, ecology, economic lines or systematic work will require one-half to three-quarters of the time spent. The thesis must give the results of original investigation and be of sufficient merit for publication.

II. A major course for the master of science degree will be about half of the above.

III. MINOR COURSES will cover such parts of the work outlined above as will be most likely to prove useful in connection with the majors taken by the students, or in their future work. It is not required that such men shall have had all the undergraduate work in entomology given at this college, their credit for a minor beginning where their own undergraduate training in the subject ended.

**Horticulture.**—Graduate work is offered in various lines of horticulture. For the most part this is divided into the different departments which now constitute the college Division of Horticulture, as follows: pomology, floriculture, landscape gardening, forestry and market gardening. For work in



these lines application should be made direct to the heads of the several departments.

Besides this work, however, opportunity is offered for graduate study in general horticulture, including topics from the several organized departments mentioned, and also questions relating to plant breeding, general evolution, propagation, manufacture of horticultural products, etc. This general work is under the direction of Prof. F. A. Waugh, head of the Division of Horticulture.

**Landscape Architecture (Major Course).** — Every student before receiving his master's degree in landscape gardening must have given some thorough and fruitful study to each of the following five departments. As far as possible these studies must be of a practical nature, *i.e.*, they must be made upon actual projects in progress of development.

1. **THEORY.** — The principles of esthetics as applied to landscape gardening.

2. **DESIGN.** — The principles of pure design and their application in landscape and garden planning.

3. **CONSTRUCTION.** — The practical methods of carrying out landscape plans, laying out, equipment, organization of working force, time and cost keeping, etc.

4. **MAINTENANCE.** — Methods, organization, cost.

5. **PRACTICE.** — Office work, drafting, estimating, reporting, charges, accounting.

**Qualifications.** — Each student before he may receive the master's degree with a major in this department must convince his instructors that he has a genuine aptitude for some branch of landscape gardening, either in design, construction or management.

The minimum period of graduate study will be one and one-half years. At least one year of this time must be spent in residence at the college, and also one year must be spent in practice outside the college. The work done outside the college may be prescribed by the department, and must be fully reported to the department in writing. It is essential, further, that the candidate secure the written approval of his employers outside the college. The department may, at its discretion, require a longer period of study at the college or a longer apprenticeship outside the college.

**Thesis or Project.** — Each student before receiving the master's degree with a major in landscape gardening must present a satisfactory thesis or complete project. A thesis will consist of a careful original study of some problem in landscape architecture, presented in typewritten form with any necessary illustrations, such as photographs, diagrams, drawings, etc. A project will consist of a completed set of studies of some suitable landscape-gardening problem, such as the design of a park, a real estate subdivision, an extensive playground. Such a project will usually consist of —

(a) Original surveys, including topography.

(b) Block plans, showing original design.

(c) A rendered plan or plans of the main features.

(d) Detailed working drawings.

(e) Estimates of cost.

(f) Complete report and letter of transmittal.

**Minor Course.** — Any student electing a minor in landscape gardening will be directed to take such courses from the regular catalogue list as may

seem most suitable for him. Under ordinary circumstances no other work will be given to students electing minors. In special cases, however, individual problems will be assigned and individual instruction given. These exceptions will be made in cases where, by so doing, it is possible to give the student material assistance in the plan of his major work.

*Prerequisite Work.* — The undergraduate courses in the college known as Landscape Gardening 50, 51, 52 and 53, Drawing 25, 26, 27, Horticulture 27, 50, 51, and Mathematics 26 and 27 will be considered prerequisite to graduate work, and any student not having passed these courses or their equivalent will be required to make up such work without graduate credit. Courses known as Landscape Gardening 75, 76, 77, 78 and 79 are required and may or may not be accepted for graduate credit, at the discretion of the department.

**Microbiology.** — I. COURSES LEADING TO THE DEGREE OF DOCTOR OF PHILOSOPHY. — 1. The candidate must present twenty-five credits from the undergraduate study as furnished in undergraduate Courses 50, 51, 52, 80, 81 or an equivalent before he can enter upon graduate study.

*Note.* — Twenty-five credits are required of undergraduates majoring in microbiology.

2. The candidate must pursue successfully the following special courses or their equivalent. These courses are designed to give a comprehensive survey of the fields indicated, and are arranged especially for graduate students.

175. Agricultural microbiology, . . . . .	5 credits.
176. Agricultural microbiology, . . . . .	5 credits.
182. Dairy microbiology, . . . . .	5 credits.
183. Food microbiology, . . . . .	5 credits.

*Note.* — Courses 175, 176, 180, 181, 182, 183 correspond in subject-matter with Courses 75, 76, 80, 81, 82, 83 of undergraduate study; the latter courses are elementary in nature, while the former are arranged for intensive advanced study of graduate character. Candidates will be required not only to perform the exercises of the above courses, but will be expected to assist in teaching the elementary classes covering the same theme as a part of graduate requirements.

3. It will be necessary to complete additionally the following courses or their equivalent, open only to graduate students:—

190. I. 1920. Studies in technique, as photomicrography, laboratory equipment and manipulation. <sup>1</sup>	
5 to 10 credits.	Assistant Professor ITANO.
151. II. 1921. Cytological and morphological studies and technique. <sup>1</sup>	
5 to 10 credits.	Professor MARSHALL and Mr. NEILL.
152. III. 1922. Physiological studies. <sup>1</sup>	
5 to 10 credits.	Assistant Professor ITANO.
177. II. 1922. Microbial studies in agriculture. Specific subjects. <sup>1</sup>	
5 to 10 credits.	Professor MARSHALL, Assistant Professor ITANO and Mr. NEILL.
181. II. 1923. Advanced sanitary or hygienic studies. <sup>1</sup>	
5 to 10 credits.	Professor MARSHALL and Assistant Professor ITANO.
150. I, II, III. Lectures and study of literature. <sup>2</sup>	
10 credits.	Professor MARSHALL, Assistant Professor ITANO and Mr. NEILL.
200. I, II, III. Research. <sup>3</sup> (Some microbiological problem related to agriculture.)	
40 to 50 credits.	Professor MARSHALL, Assistant Professor ITANO and Mr. NEILL.

<sup>1</sup> Repeated every three years.

<sup>2</sup> Continues over three years, once each week.

<sup>3</sup> Distributed as may be most beneficial for research work. Time and credit by arrangement.

The thesis prepared must be satisfactory to the department and the graduate staff, and the candidate must be ready to defend it at his public examination. Further, following the presentation of the thesis, the candidate must submit to a written examination covering the entire subject by the department and a public oral examination under the auspices of the graduate staff.

II. COURSES LEADING TO THE DEGREE OF MASTER OF SCIENCE. — 1. Prerequisite studies, as in the case of the degree of doctor of philosophy (I, 1).

2. Special studies as represented by courses —

175. Agricultural microbiology, . . . . .	5 or 10 credits.
176. Agricultural microbiology, . . . . .	5 or 10 credits.
182. Dairy microbiology, . . . . .	5 or 10 credits.
183. Food microbiology, . . . . .	5 or 10 credits.

3. Courses designed for graduate students only.

150. I, II, III. Lectures and study of literature. 5 credits.	Professor MARSHALL, Assistant Professor ITANO and Mr. NEILL.
200. I, II, III. Research. <sup>1</sup> (Some microbiological problem related to agriculture.) 15 to 25 credits.	Professor MARSHALL, Assistant Professor ITANO and Mr. NEILL.

The thesis submitted must be satisfactory to the department and to the graduate staff.

The candidate will be required to take a written examination and an oral examination by the department.

III. MINOR WORK IN MICROBIOLOGY. — May consist of Undergraduate Courses 50, 51, 52, and one other course, designed to support his major work, from among Courses 175, 180, 181, 182, 183. He will also be required to pursue Graduate Course 150 through four terms (see II, 3, 150). In case the candidate has had some of these courses he will be required to take more advanced substitute courses. A written examination over the subject-matter covered will be given at the close of the work.

**Poultry Science** (Major Course for the Degrees of M.S. and M.Agr.). —

1. READING. — A review of the entire field of poultry literature, covering books, bulletins and special articles, is made, and a written report on one or more subjects required.

2. SEMINAR. — A critical review and a criticism of the more important experiments carried on at the various stations in this and other countries; also a study of poultry conditions in foreign countries, methods of management, etc., besides a detailed study of some of the largest poultry projects in this country.

3. ANATOMY (GROSS AND HISTOLOGICAL), PHYSIOLOGY AND SURGERY. — This course requires a careful study of the anatomy and physiology of the fowl. Special attention is given to a study of those structures concerned with practical poultry problems. Instruction in surgical technique, adapted to fowls, may also be given.

4. BREEDING. — The student will carry on such breeding experiments as time and facilities permit. He may also do work in connection with our regular experimental projects. A detailed study of the pertinent literature will be required. Animal Husbandry 5, or its equivalent, is a prerequisite.

<sup>1</sup> Distributed as may be most beneficial for research work. Time and credit by arrangement.

5. **FEEDING.** — A study of the relation of various foods and other substances to the morphology and physiology of the bird, with special reference to such subjects as egg production, feather form and structure, condition of flesh, bone, etc.

6. **BROODING.** — Studies will be made upon the relation between viability and rate of growth and the following topics: type of brooder, number of chicks in brood, ventilation, humidity, sanitation, exercise and weather conditions; also a comparison of natural methods with artificial methods of rearing chicks.

7. **INCUBATION AND EMBRYOLOGY.** — A number of problems of a practical, scientific and mechanical nature relating to incubation are considered. The work in embryology is of an advanced nature dealing with its relation to morphogenesis and heredity, and presupposes an elementary knowledge of the embryology of the chick.

8. **POULTRY DISEASES AND SANITATION.** — In this course a study is made of various problems in poultry sanitation, with particular reference to methods relating to the control and eradication of disease.

9. **THESIS.** — A thesis based on first-hand work on some problem in poultry biology or husbandry is required of all students working for the M.S. degree, and may be required of those working for the M.Agr. degree.

*Note 1.* — The postgraduate course presupposes all undergraduate work or its equivalent, together with practical experience. Without the latter, students will be unable to handle Courses 5, 6 and 7. At the discretion of the instructor in charge, graduate students may be required to pursue undergraduate courses in other departments without credit.

*Note 2.* — Practical poultry work may be required, but no credit will be given for such work.

*Note 3.* — Courses 1 and 2 are designed particularly for minors.

**Rural Sociology.** — Courses are offered in Rural Sociology as major or minor subjects for the degree of doctor of philosophy.

Candidates for the master's degree will be required to pass an examination in all courses offered by this department primarily for undergraduates, as shown in the departmental classification. In addition they will be required to select one or more of the divisions of the subject for intensive study and research, as indicated below.

A thesis showing the results of personal investigation on some particular topic or topics must be presented. The thesis must show familiarity with the material bearing on the subject, ability in discovering and utilizing original sources, judgment in evaluating facts, evidences and authorities, originality and independence of thought. It must be a contribution in a very definite way to rural sociological thought.

#### TOPICS FOR STUDY AND RESEARCH.

1. The rural community: —

- (a) Historical development.
- (b) Influence of modern conditions on family and community life.
- (c) Problems and methods in community organization.
- (d) Community planning in Massachusetts.

2. Origin and development of rural institutions: —

- (a) Scope, function and influence of educational institutions on rural social progress.  
Plans for betterment.
- (b) History of the development of the rural church, its problems and program for improvement.
- (c) The farm family, in its relation to religious, cultural, educational and social agencies.  
The relation of the standard of living to rural social progress.

## 3. Rural organization: —

- (a) The scope and function of rural organization in development of rural life.
- (b) Work of the national government in rural organization.
- (c) County and institutional work in rural organization.
- (d) Leadership in its relation to organization.

## 4. Rural government and rural law: —

- (a) Development of rural local government in New England and the west. Progress in efficient local self-government.
- (b) Relation of the State to the farmer, influence of the farmer in legislation, the organized ways and means by which the State aids the farmer directly.
- (c) Work of the national government in its relation to the social welfare of the farming people.
- (d) Agrarian legislation in the United States and Europe affecting rural social welfare.

## 5. Farmers' organizations: —

- (a) Social problems underlying farmers' organizations in reference to service and permanency.
- (b) Principles of organization.
- (c) History of farmers' organizations in the United States.

## 6. Rural social and sociological surveys: —

- (a) An intensive study of the place and function of statistical data in the sociological field, its evaluation and interpretation.
- (b) A critical study of social surveys of rural life and methods of survey, with a view to discovering the strength and weakness of each.

## 7. Social condition of the rural people: —

- (a) Origin and development of rural ideals.
- (b) The status of the rural people in relation to health, morality, crime, etc.
- (c) Problems of social psychology arising in rural life.

The course required for candidates offering a minor will be arranged after a conference with the director of the department, and will take into consideration the needs of the student in view of his previous preparation. The amount of time required of the student for his minor work will correspond with the requirements of the graduate school.

**Veterinary Science.** — Work is available in anatomy, hygiene, veterinary pathology, medicine, surgery, parasitology and other special lines or divisions of the subject.

**Zoölogy.** — Courses in zoölogy may be available as a minor for the degree of master of science and as a minor for the degree of doctor of philosophy. The nature of the work will necessarily vary according to circumstances, and may be intensive in a special field and correlated closely with the major work of the student, or it may be of a more general character, depending on the student's needs or previous acquaintance with general zoölogical science. The time devoted to zoölogy as a minor for either of the above-named degrees may vary from 12 to 16 hours per week, pursued for a year and a half.

#### LIST OF STUDENTS.

A list of the degrees conferred in the Graduate School, and of the students enrolled, is given in the general lists at the end of the volume.



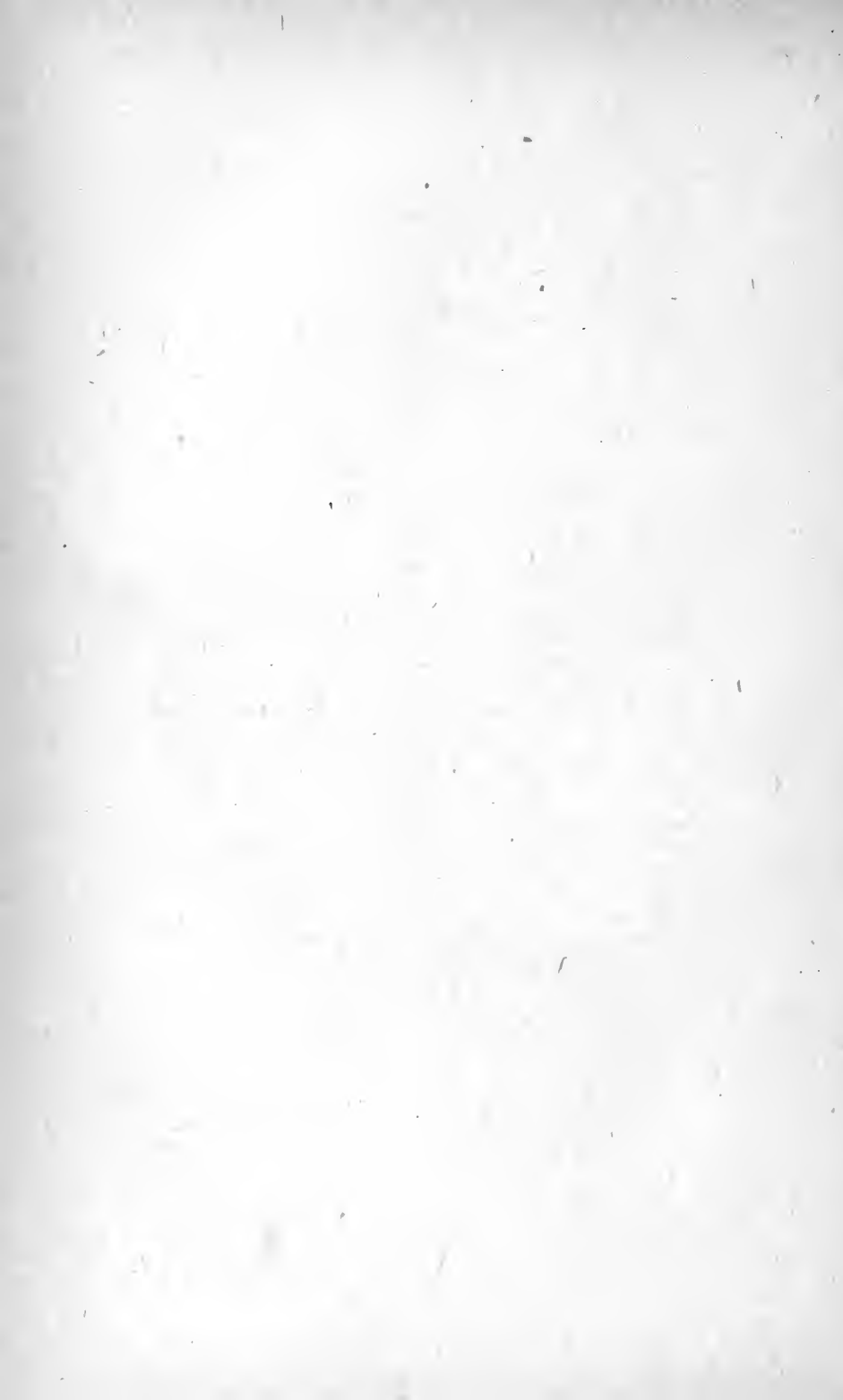
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# THE SHORT COURSES

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## THE SHORT COURSES.

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The short courses offered by the Massachusetts Agricultural College are designed to meet the needs of those, both young and old, who cannot come to the college for the regular agricultural courses. They furnish the student with instruction in modern accepted methods and are planned to help the farmer and the housewife.

The short courses include:—

- A. The Two-year Course in Practical Agriculture.
- B. The Ten Weeks' Winter School.
- C. The Summer School.
- D. The Vocational Poultry Course.
- E. Unit Courses.
- F. The Regional School.

**REQUIREMENTS FOR ADMISSION TO SHORT COURSES.**—Students must be at least seventeen years of age and must furnish satisfactory evidence of good moral character. References are required. There are no entrance examinations. The sole test is ability to do the prescribed work. Students enrolling for the Two-year Course in Practical Agriculture must have at least a common school education.

**EXPENSES OF SHORT COURSES.**—The expense of attending any of the short courses is approximately as follows:—

Furnished rooms in private houses (per week), . . . . .	\$3 to \$5
Board at college dining hall (per week), . . . . .	\$7
Board with private families (per week), . . . . .	\$6.50 to \$9
Registration fee (Ten Weeks' Winter School), . . . . .	\$5

Tuition in all the short courses is free to residents of the Commonwealth. Small laboratory fees are charged in some of the courses.

### A. TWO-YEAR COURSE IN PRACTICAL AGRICULTURE.

The Two-year Course in Practical Agriculture is offered to meet the needs of students who for one reason or another cannot take the four-year college course. It is designed to provide the largest amount of practical information and training in agriculture and horticulture in the shortest possible time consistent with thoroughgoing work. This course is open to men and women seventeen years of age or over who have at least a common school education.

This course is especially arranged and suited for young men and women who expect to make a business of some line of agricultural work, such as dairying, livestock raising, poultry, horticulture, general farming, etc.

It will appeal not only to young men and women but also to men and women of mature years and practical experience who wish to know more about the

business of farming. Although the course is planned to meet the needs of those who are not graduates of high schools, the instruction is not preparatory or elementary in its nature, but is so planned that it will be of value to all. The greater amount of academic training that some of the students may possess will in a measure be offset by the fund of practical knowledge possessed by many who have completed only the elementary schools.

The course is not intended for students enrolled in high schools. Such students should finish the high school course. Students enrolled in high schools who wish to take the course should bring a statement either from the principal of the high school or from parent or guardian asking permission to be enrolled.

The Two-year Course in Practical Agriculture is so arranged that the student receives instruction in fundamental subjects and is given an opportunity to select the lines of work during the second year in which he is particularly interested.

As now organized it makes available to the student three courses in agronomy, five courses in animal husbandry, five courses in fruit growing, six courses in rural engineering, five courses in dairying, four courses in poultry, four courses in rural home life, one course in farm manufacturing, three courses in forestry, four courses in farm business, one course in hygiene and sanitation, one course in English, three courses in vegetable gardening, three courses in floriculture, one course in insect pests and two courses in botany. The advantages of the college staff of specialists and the college plant with all its resources are thus made available to young men and young women who may not have had the opportunity of securing a high school education.

The first year consists of six months of study at the college. The term begins with the college fall term and closes with the winter term of the regular session. The same vacation periods are observed as in the regular four-year course.

At the close of six months of study, students are required to gain six months of farm experience. The college will assist students in finding positions and in placing them on farms where the experience gained will be of great advantage. Thus, an effort will be made to place on a dairy farm the man expecting to take up dairying as his chief line of work, and a student of pomology on a fruit farm.

During the second year the student spends nine months in resident study. He is required to select from the following list of major subjects two which he will carry throughout the year, in addition to the required courses: fruit growing, dairying, poultry husbandry, vegetable gardening, floriculture, general horticulture and rural home life.

Each student is required to file with the treasurer of the college a statement, signed by the town (or city) clerk of the town (or city) from which he enrolls, stating that the parent or guardian of the student is a resident of that town.

**CERTIFICATE.** — All students will receive a certificate showing their standings in courses in which they were registered. Credits earned in the Two-year Course in Practical Agriculture or in any other of the short courses do not lead to the college degree. Students who possess college entrance requirements and who wish to take the regular college work should address the registrar of the college.

# THE COURSE OF STUDY OF THE TWO-YEAR COURSE IN PRACTICAL AGRICULTURE.

## FIRST YEAR.

### Required Courses.

<i>First Term.</i>	<i>Second Term.</i>	<i>Third Term.</i>
Soil Fertility, . . . 3	Principles of Feeding, . . 3	Six months' farm experience.
Types and Breeds, . . 5	Fruit Growing, . . . 3	
Fruit Growing, . . . 3	Repair of Farm Equipment, . . . 2	
Sanitation and Hygiene, 3	Dairy, . . . . 3	
	Poultry, . . . . 3	

### Electives.

<i>First Term.</i>	<i>Second Term.</i>
Farm Machinery, . . . 3	English, . . . . 2
English, . . . . 3	Farm Law, . . . . 5
Farm Structures, . . . 5	Rural Home Life, . . . 3
Rural Home Life, . . . 3	Farm Arithmetic, . . . 3
Farm Arithmetic, . . . 3	Agricultural Opportunities, <sup>1</sup> . . . 1
Agricultural Opportunities, <sup>1</sup> . . . 1	

## SECOND YEAR.

### Required Courses.

<i>First Term.</i>	<i>Second Term.</i>	<i>Third Term.</i> <sup>2</sup>
Insect Pests, . . . . 5	Farm Management, . . . 5	Plant Diseases, . . . . 5
Feeding and Management, . . . . 3		Marketing, <sup>2</sup> . . . . 5
		Social and Economic Problems, . . . . 3

Two electives must be chosen from the following list and carried throughout the second year:—

<i>First Term.</i>	<i>Second Term.</i>	<i>Third Term.</i>
Fruit Growing, . . . . 5	Fruit Growing, . . . . 5	Fruit Growing, . . . . 5
Dairy, . . . . . 3	Dairy, . . . . . 3	Dairy, . . . . . 3
Poultry, . . . . . 5	Poultry, . . . . . 5	Poultry, . . . . . 5
Vegetable Gardening, . . 5	Vegetable Gardening, . . 5	Vegetable Gardening, . . 5
Floriculture, . . . . . 5	Floriculture, . . . . . 5	Floriculture, . . . . . 5
General Horticulture, . . 5	General Horticulture, . . 5	General Horticulture, . . 5

Additional electives from which the student may choose, one in the winter and two in the spring term:—

<i>First Term.</i>	<i>Second Term.</i>	<i>Third Term.</i>
Farm Manufacturing, . . 3	Animal Breeding, . . . 3	Crops, . . . . . 5
Rural Home Life, . . . 3	Carpentry, . . . . . 3	Animal Diseases, . . . 3
	Dairy Bacteriology, . . 3	Agricultural Credit, <sup>2</sup> . . 5
	Rural Home Life, . . . 3	Drainage and Irrigation, 3
		Rural Home Life, . . . 3
		Gas Engines, . . . . . 5
		Feeding and Management, . . . . 3

<sup>1</sup> Required for women students.

<sup>2</sup> This course will not be given during 1920.

## B. THE WINTER SCHOOL.

The Winter School, beginning usually about January 1 and continuing for ten weeks, was started several years ago and has always been very popular, not only with more mature farmers and their wives, but with young men and women who control or manage farms. The courses, though short, are very practical in their nature, and are so arranged that a student may choose such subjects as will enable him to specialize along the line of work in which he is most interested. There is a wide range in the choice of subjects, making it possible for the student to take work for several winters in succession. Many college graduates enroll for the Winter School.

**SCHOLARSHIPS.** — The Jewish Agricultural and Industrial Aid Society of New York has instituted a system of free scholarships to enable the children of Jewish farmers to attend the short winter course in the States in which they reside. The stipend is sufficient to pay all the expenses of the holder for the course; such expenses usually amount to from \$100 to \$150. The following courses are offered: —

## OUTLINE OF THE TEN WEEKS' WINTER SCHOOL, DECEMBER 30 TO MARCH 5.

- Soil Fertility. Professor BEAUMONT. Three lectures a week.  
 Field Crops. Two lectures and one two-hour laboratory period per week.  
 Types and Breeds of Livestock. Three lectures and two two-hour laboratory periods a week.  
 Livestock Feeding. Three lectures per week.  
 Animal Breeding. One lecture and one two-hour laboratory period per week.  
 Dairying. Professor LOCKWOOD and assistants. Five lectures and five laboratory periods per week.  
 Dairy Bacteriology. Professor MARSHALL. Two lectures and one two-hour laboratory period per week.  
 Animal Diseases and Stable Sanitation. Professor PAIGE. Two lectures per week.  
 Poultry Husbandry. Five lectures and one two-hour laboratory period per week.  
 Fruit Growing. Professor SEARS. Three lectures and one two-hour laboratory period per week.  
 Market Gardening. Mr. HARRIS. Three lectures and two two-hour laboratory periods per week.  
 Floriculture. Professor THAYER and Mr. WHITING. Five lectures per week.  
 Horticultural Manufacture. Professor CHENOWETH. Two lectures and two laboratory periods per week.  
 Farm Management. Assistant Professor ABELL. Two lectures a week.  
 Farm Accounts. Assistant Professor ABELL. Two two-hour laboratory periods per week.  
 Marketing. Professor CANCE and assistants. Two lectures a week.  
 Agricultural Credit. Professor CANCE and assistants. Two lectures a week.  
 Botany. Assistant Professor McLAUGHLIN. Two lectures a week.  
 Entomology. Assistant Professor REGAN. Three lectures per week.  
 Farm Structures. Assistant Professor STRAHAN. Two lectures and one two-hour laboratory period per week.  
 Farm Machinery. Professor GUNNESS. Two lectures and three two-hour laboratory periods a week.  
 Rural Sanitary Science and Hygiene. Professor MARSHALL. Two lectures per week.  
 Vocational Guidance. Miss HAMLIN. One lecture per week.  
 Foods. Miss SKINNER. One lecture and two two-hour laboratory periods per week.  
 Clothing. DEPARTMENT OF HOME ECONOMICS. One lecture and two two-hour laboratory periods per week.  
 The Business of the Household. Miss SKINNER. Three class hours per week.  
 Home Care of the Sick. Miss SKINNER. Three class hours per week.  
 Principles and Methods of Vocational Agricultural Teaching. Professor HART. Five exercises per week.  
 Special Methods in Vocational Agricultural Teaching. Professor WELLES. Five exercises a week.  
 Professional Improvement Problems. Mr. HEALD. Five periods per week.

## C. THE SUMMER SCHOOL.

In 1919 a plan of co-operation between the Massachusetts Agricultural College and the Division of Elementary and Normal Schools of the State Department of Education was begun. Twenty-five courses were offered in agriculture and horticulture, and nineteen courses in education.

The enrollment was the largest in the history of the college. The plan was so satisfactory that it was continued in the 1920 Summer School. More courses in agriculture, horticulture and education were offered. Three hundred and nineteen students were enrolled.

The following subjects were offered: —

## Agriculture: —

Soil fertility.  
Manures and fertilizers.  
Types and breeds.  
Feeding and management.  
Dairying.  
Poultry.  
Farm management.  
Farm accounts.  
Farm machinery and gas engines.  
Repair of farm equipment.

## Horticulture: —

Garden flowers.  
Indoor flower growing.  
Food Preservation I.  
Food Preservation II (two weeks).  
Fruit growing.  
Vegetable gardening.

## Home life and practical arts: —

Foods.  
Elementary dietetics.  
Clothing I.  
Clothing II (advanced).  
Business of the household.

## Education: —

Primary language.  
Primary reading.  
Arithmetic I (primary).  
Arithmetic II (intermediate).  
Method of teaching history in grammar grades.  
Training in the duties of citizenship.  
Methods in elementary schools.  
Methods in English for the intermediate and grammar grades.  
Design and practical arts.  
Oral English and parliamentary practice.  
Organized play and recreation.

## Related subjects: —

Insect life.  
Hygiene and sanitation.  
Marketing agricultural products.  
Plant diseases.  
Rural sociology.  
Agricultural opportunities for women.

## Vocational agricultural teaching: —

Principals and methods of teaching.  
Special methods in vocational agricultural teaching.  
Professional improvement problems.

In addition to the four weeks' school, a six weeks' course in agricultural education, from June 28 to August 6, was given.

The Two-year Course was continued for an eight weeks' term during the summer, from June 28 to August 28, to accommodate ex-service men in training under the Division of Rehabilitation of the Federal Board for Vocational Education.

## D. ONE-YEAR VOCATIONAL COURSE IN POULTRY HUSBANDRY.

PURPOSE. — This course is designed for graduates of the agricultural vocational schools and others who wish to prepare themselves for practical poultry keeping, and can spend only one year at college.

SCOPE. — The work covers seven detailed courses in poultry husbandry, as well as short-course work in fruit growing, market gardening, animal

husbandry, or other subjects that will be helpful to poultry raisers. In addition to classroom and laboratory exercises each student is required to put in from twenty-five to thirty hours per week at the plant in the care and management of poultry, for the purpose of becoming proficient in the various branches of the work.

ENTRANCE REQUIREMENTS.—Applicants must be at least eighteen years of age and have a good elementary education.

FEES.—There is no tuition for residents of Massachusetts, but a laboratory fee of \$5 is required for both the fall and spring terms.

NOTE.—The course is limited to 16 students. The One-year Poultry Course begins in December and continues until the following December.

### E. UNIT COURSES.

The Unit Courses were organized to provide instruction for men disabled in the military or naval service of the United States, who were unable on account of limited education to enter the Two-year course.

A student enters the agricultural Unit Courses if his previous education is not sufficient to permit of his taking up the work of the Two-year Course. The agricultural Unit Courses begin every month in the year except September. Each man may select, in addition to the English and mathematics that is required, two or three lines of work to which he will expect to devote most of his time.

In connection with the Unit Courses there is much actual practice on the farms, orchards, gardens, in the dairies, barns, shops and greenhouses, and with poultry, live stock and farm machinery. These courses are limited to students sent by the Federal Board for Vocational Education.

The following subjects are offered:—

Agronomy.  
Animal husbandry.  
Dairying.  
General horticulture.  
English.  
Arithmetic.

Fruit growing.  
Vegetable gardening.  
Poultry.  
Farm mechanics.  
Floriculture.  
General horticulture.

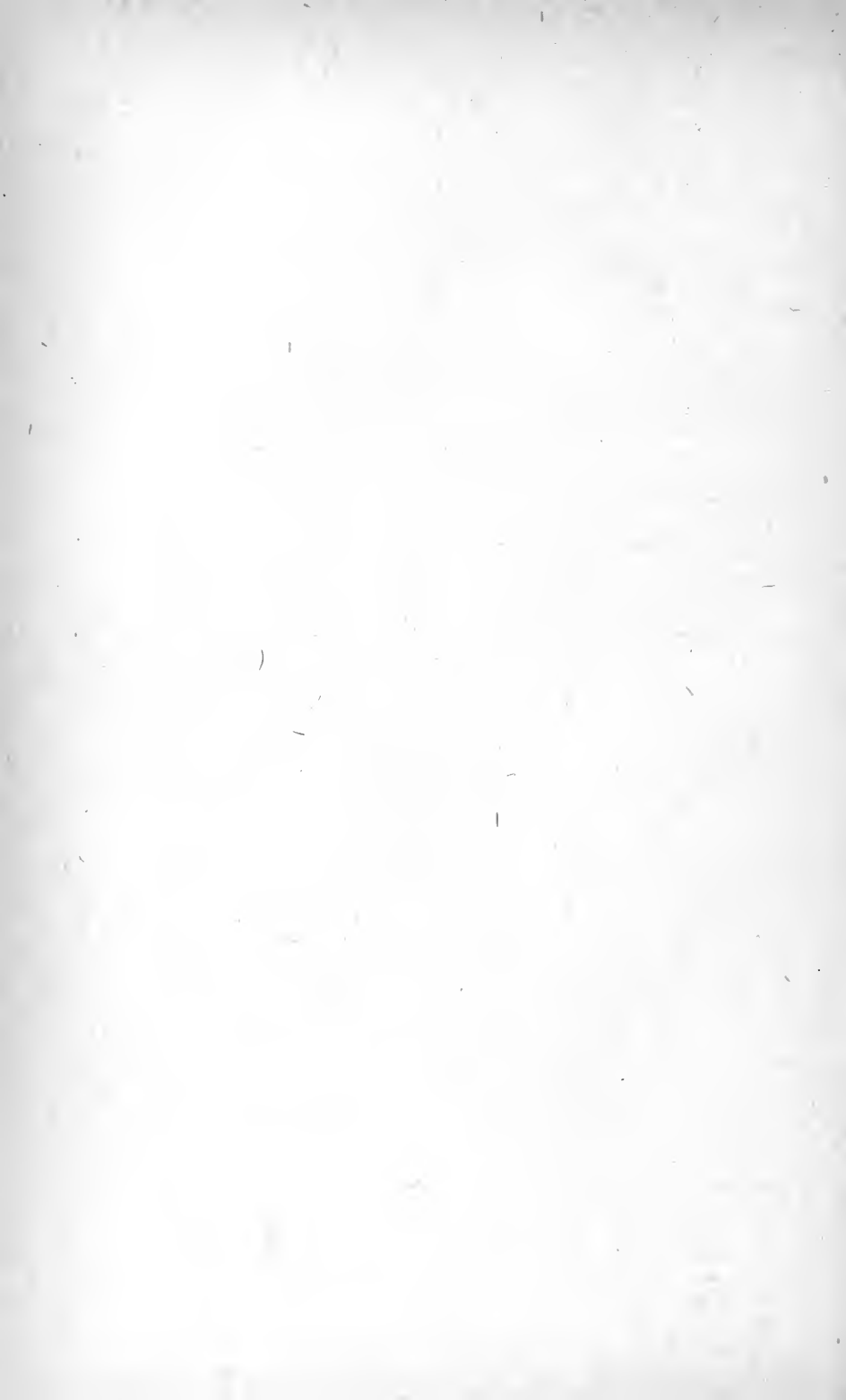
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# THE EXTENSION SERVICE

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## THE EXTENSION SERVICE.

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The Extension Service of the Massachusetts Agricultural College is an organized effort to carry systematic and practical instruction to the thousands of people throughout the State who are unable, owing to various reasons, to take advantage of the regular courses offered at the college. It is in reality the "carrying of the college to the people of the State." Every department of the institution, in so far as the regular teaching and research work will permit, contributes what it can to this work. There is also a regular staff of extension workers whose business it is to present the instruction of the college to individuals and various educational organizations, such as extension schools, granges, Y. M. C. A.'s, churches, boards of trade, etc., throughout the State, in addition to giving county farm bureaus assistance in their project work. Extension work includes the following: extension courses at the college; home study courses; itinerant instruction, including lectures and lecture courses, exhibits, demonstrations and extension schools; extension work through the various departments of the college, in which the extension specialist is responsible to the head of the department for the technique of the work and to the director of the Extension Service for its accomplishment; co-operative work of various kinds with the United States Department of Agriculture; and extension work through county, district and local agents. Some of the ways in which this is being done are briefly described below.

### CONFERENCES AT THE COLLEGE.

Meetings of the duration of one week or under are managed by the Extension Service, and include, in the winter, programs for special agricultural interests or organizations, and, in the summer, the big summer Farmers' Week.

**THE WINTER COURSES.** — These courses are arranged to meet the demand for a short course of instruction on agricultural subjects, requested by such interests as the State institutional managers and various live-stock, crops, tobacco, fruit and market-gardeners' associations. A sheep-shearing contest is also arranged for the sheep breeders' association. Instruction is presented by lectures, demonstrations and conferences. The college equipment is available for use, and the subject-matter may be selected or suggested by those expecting to attend. The work of the college faculty may be supplemented by lectures and demonstrations by eminent men and women from our own and other States. No fee is charged.

**SUMMER FARMERS' WEEK.** — The second summer Farmers' Week, held at the college July 26 to 30, 1920, was attended by 5,300 people who were able to inspect the college farms and orchard at the height of the growing season. Summer Farmers' Week was instituted to meet the demand for an oppor-

tunity to see the actual outdoor work of the college farm and experiment station, and to see the college teaching put into practice in the field. As the winter meetings of necessity are confined to indoor lectures and demonstrations, the summer Farmers' Week places the emphasis on outdoor work, and limits the program to one or two lectures a day. The greater part of the time is devoted to personally conducted field trips to all parts of the college property. Various agricultural organizations have field days at the college during the week, and every available facility for their entertainment is placed at their disposal. Farm bureaus, agricultural organizations and individual farmers co-operate in supplying requested information as to the probable subject-matter which visitors desire on the program. With the program for the week is furnished a detailed map of the college property, and, with the signs and guideposts which are numerous displayed to explain various features, the services of a guide are not required to see what is desired.

**ANNUAL CONFERENCE OF COUNTY AGENTS.** — In December of each year a one-week conference of county agents is held at the college. This is for the purpose of correlating the extension work throughout the State, and to enable the field workers to keep in up-to-the-minute touch with agricultural problems, methods and research as conducted in Massachusetts as well as other States in this particular section of the country. The next annual conference will be held during the second full week in December, 1920.

**POULTRY CONVENTION.** — The annual poultry convention, now included as one of the main events on the program of summer Farmers' Week, is the most important meeting in the State for the poultry public. Men of national reputation are secured for this occasion. In preparing the program, the wishes and needs of the poultry men and women are given first consideration, and topics of the most timely interest are listed for discussion by the best-informed authorities.

**HOME STUDY COURSES.** — The purpose of the home study courses is to furnish systematic instruction in those lines which will most benefit the general farmer, the dairyman, the fruit grower, the market-gardener, the poultryman, the teacher, the home maker, and all others who are interested in agricultural and country-life matters. It is the purpose to present up-to-date, accurate and concise information in such a manner and in such language that all who pursue the study may readily understand the work.

*Courses offered.* — A number of courses are in process of revision and several are being rewritten. During 1920 courses will be available as follows: —

1. Soils and Soil Fertility. Professor BEAUMONT.
2. Manures, Fertilizers and Soil Amendments. Professor BEAUMONT.
3. Field Crops. Professor JONES.
4. Farm Dairying. Professor LOCKWOOD.
5. Fruit Growing. Professors SEARS and VAN METER.
6. Vegetable Gardening: Part I, Market Gardening; Part II, Home Gardening. Prof. H. F. TOMPSON.
7. Farm Accounts. Professors FOORD and MACDOUGALL.
8. Entomology. Dr. REGAN.
9. Forestry. Professor GROSE.
10. Shade Tree Management. Professor OSMUN.
11. Plant Diseases. Professor OSMUN.
12. Poultry Husbandry. Professors GRAHAM and PAYNE.
13. Home Economics. Miss SAYLES.

*Methods of conducting the Work.* — The best known methods of conducting correspondence course teaching are employed. Certain courses are based entirely upon textbooks, others consist wholly of typewritten lectures, while others combine the two. If books are not required they are usually recommended.

The courses are designed primarily for the individual student, although experience has shown the advantages of the group method of home instruction. Prospective students should endeavor to find four or more others who will enroll in the same or other courses, so that a study class may be formed. Such a method has the advantage of instruction under the guidance of a leader, who is a member of the class. Furthermore, it is usually possible for the Extension Service to send a speaker to the class two or three times during the term to help the members of the group with their individual problems. The college library will also arrange for the loan of books to be used as text and reference reading.

*Enrollment of Home Study Courses.* — Students may enroll in the courses at any time between October 1 and June 1, and one year from the date of registration is allowed for the completion of each course.

*Expenses of the Courses.* — In order that none shall enroll except those who are interested and desire to pursue earnest study, a small fee is charged. This has been fixed at \$2 for each course except where the courses are divided, and it has been found advisable to charge \$2 for each of the parts in these instances. The fee is payable strictly in advance, at the time the enrollment card is sent. When textbooks are required the student purchases these.

**LECTURES AND DEMONSTRATIONS.** — The members of the faculty of the college are, when other duties will permit, available for lectures and demonstrations before granges, men's clubs, women's clubs, Y. M. C. A.'s, farmers' clubs, boards of trade and other organizations. Organizations arranging the lectures are asked to pay the traveling expenses of the lecturer, provided no admission fee is charged. When admission is charged the lecturer is entitled to a fee in addition to traveling expenses.

**EXTENSION SCHOOLS.** — Agricultural extension schools dealing with the production side of farming and with the problems of the farm home are offered to communities where there is the desire to have the college brought to the community. The college sends a corps of instructors and the necessary equipment to put on a program of instructional work in live-stock, crops, soils, fruits, market-gardening, poultry or farm management and home makers' courses for women. Communities desiring an extension school make a written request, agreeing to defray all local expenses, such as the rent, heating and lighting of a suitable hall, and the board of the instructors during the school. Information can be obtained by writing to the Extension Service of the Massachusetts Agricultural College.

**EDUCATIONAL EXHIBITS AT FAIRS AND OTHER SHOWS.** — The college co-operates with the managers of fairs, industrial expositions, corn shows, poultry shows, fruit shows and other exhibitions by making educational exhibits. Where practicable the exhibit is accompanied by lecturers and demonstrators.

#### EXTENSION WORK IN SPECIAL FIELDS.

**EXTENSION WORK IN FRUIT GROWING.** — This work includes lectures and demonstrations on laying out and planting orchards, pruning, spraying, thinning, grading, packing and marketing fruits. Demonstration orchards,

new and renovations plots, are established in different sections of the State, under a co-operative agreement between the college and the owners of land. Extension schools in fruit growing and fruit grading and packing are arranged on request. Visits to farms for advisory work are made, and correspondence on orcharding subjects is invited.

**EXTENSION WORK IN ANIMAL HUSBANDRY.** — The purpose of this work is primarily to acquaint the farmers of the State with improved methods of developing the live-stock industry of the State. This is done by assistance rendered communities of farmers who wish to organize live-stock centers, and also by co-operating with other active educational organizations already established.

Upon request, and where conditions favor the organization of county live-stock clubs, cow testing associations and bull associations, assistance is provided.

Live-stock feeding, breeding and management demonstrations are established in different sections of the State under co-operative agreement between the college and the owners of live stock. Extension schools, involving the selection, housing, general management and marketing of live stock, are arranged on request. Advisory trips to farms are made, and correspondence on subjects relating to live stock is invited.

**EXTENSION WORK IN DAIRYING.** — This includes lectures and demonstrations on the handling and care of milk, cream, butter and cheese; Babcock testing, dairy utensils and dairy manufactures. Educational campaigns may be arranged in different communities, seeking to educate producers, dealers and consumers as to the production and distribution of clean, safe milk. Through correspondence and personal visits advice is given —

1. To help the improvement of the quality of dairy products.
2. To help in the problem of more economical handling and manufacturing.
3. To help stimulate a larger and continued use of dairy products.

**EXTENSION WORK IN POULTRY HUSBANDRY.** — In addition to such general activities as lectures, demonstrations, extension schools, exhibits, conferences, farm visits, bulletins and plans for developing poultry plants, the poultry extension practice is to emphasize, each year, two or three urgent needs of the industry in State-wide campaigns aiming to reach all poultrymen of the State.

In co-operation with the several county farm bureaus definite county projects and community programs are arranged; and co-operative work is undertaken with many local poultry associations. Service is also rendered in the diagnosis and control of poultry diseases.

The annual poultry convention on the campus is attended by hundreds of poultrymen.

**EXTENSION WORK IN SHEEP HUSBANDRY.** — The extension work in sheep husbandry, started in 1917 in co-operation with the United States Department of Agriculture, was temporarily discontinued upon the resignation of the sheep specialist in October, 1920.

**EXTENSION WORK IN FARM MANAGEMENT, FIELD STUDIES AND DEMONSTRATIONS.** — This is carried on co-operatively between the college and the office of farm management of the United States Department of Agriculture at Washington. The work consists of a study of farm conditions, followed by suggestions for handling farm management problems, often involving an

adjustment of the different enterprises, such as dairy, orchard or field crops, so as to give economical use of labor and material, and make a profitable business. Specific advice is given upon the planning of farms and farm buildings, the proper farm equipment and the keeping of farm accounts.

**EXTENSION WORK IN SOILS AND CROPS.** — The subject-matter of this work considers the economical production of crops and the economical maintenance of soil productivity in Massachusetts. The crops adapted to Massachusetts conditions, their relative place in agriculture, their culture, fertilization, etc., are considered.

The work done can be grouped under the following main headings: —

1. Project work, county farm bureaus: —

(a) Assistance in soil and crop problems and in demonstration work.

(b) Assistance at meetings and in work with individual farmers and organizations.

2. Correspondence. Conducting correspondence courses and answering inquiries sent to the college.

3. Lectures and demonstrations at meetings and extension schools.

4. Preparation of exhibit material.

5. Preparation of short articles dealing with timely soil and crop problems.

**EXTENSION WORK IN HOME ECONOMICS.** — This work includes lectures and demonstrations on subjects pertaining to homemaking. This year special emphasis will be placed on clothing, household management and right food for the family. Instruction is carried on by means of a series of lessons given to groups who are housekeepers and leaders as well. All work is done in co-operation with the county home demonstration agents.

**JUNIOR EXTENSION WORK.** — This is an organized effort to promote among young people between the ages of ten and nineteen years the study of agriculture and home economics in the home. The work organized by the United States Department of Agriculture is carried on by the college in co-operation with county farm bureaus or improvement leagues. As far as possible the young people are organized into groups or clubs; where this is impossible the work is done with the individual. An endeavor is made to obtain some one in each community to act as a local leader of the club. Many school superintendents find it one means of stimulating enthusiasm for outdoor life among their pupils. Throughout the State teachers of rural schools use it to tie up the school and home life. City school teachers have found it helpful in finding the rural-minded pupils living under urban conditions. Exhibits held locally or at county and State fairs do much to arouse a wholesome spirit of competition among the members. The State Department of Agriculture and several private organizations appropriate money to further the work. The work is usually introduced by conferences with individuals interested, and lectures before any organization interested in young people and desiring to see the work carried on in any community.

**LIBRARY EXTENSION WORK.** — This consists principally of loaning to the libraries of the Commonwealth general collections of the latest and best books and bulletins on agriculture and home economics. Smaller collections or package libraries on special subjects, such as fruit harvesting and marketing, dairying, poultry houses, beekeeping, home economics, country schools and other topics, are also sent out.

This material is loaned for a period of eight weeks, subject to renewal when possible. All transportation charges for shipments to or returned from

borrowing libraries are paid by the Extension Service. The college library also supplies lists of books on various subjects, and also information about books on agriculture, home economics and related subjects.

LOCAL COMMUNITY ORGANIZATION. — Work under this project is temporarily suspended, leave of absence having been granted to the project leader to do some special work with the National Red Cross.

EXTENSION WORK IN AGRICULTURAL ECONOMICS. — Work in this field has been developing along six lines all connected with commercial agriculture, emphasizing the production of value or money returns rather than volume of agricultural products. Much of this work is conducted in direct co-operation with the United States Department of Agriculture.

(a) *Rural Credit*. — Sources and means of providing credit for buying or financing farms, purchasing supplies or storing and distributing farm crops.

(b) Better methods of marketing, grading and distributing farm crops.

(c) Assistance in organizing co-operative buying and selling associations. Helping to establish producers' city and country milk plants and co-operative tobacco packing plants.

(d) Assistance in establishing farmers' markets, both wholesale and retail, in cities, to furnish an outlet for perishable local produce and to provide a better market for consumers.

(e) *Direct Marketing*. — The college was the first agency to bring about direct connection between farmers and industrial plants for trading in potatoes, onions, etc., from farm to consumer.

(f) *Market News Survey*. — In co-operation with the farm bureaus and United States Bureau of Markets, a plan has been perfected whereby a daily market report of wholesale and retail prices of local produce is being furnished by the farm bureaus to a number of daily papers. These reports, made in retail units, have been very helpful both to producers and to city consumers.

FOOD PRESERVATION. — On account of the demands for instruction in food preservation, particularly preservation of fruits and vegetables, much attention was given to this work during the year, the work being carried on chiefly through training local leaders to handle the work. Special attention is given to the manufacture of fruit by-products, to home and farm storage and to the operation of preservation kitchens. The project is carried out through demonstrations, extension schools, farm visits and correspondence.

FARM BUREAU WORK. — Co-operative extension work is carried on in counties by means of farm bureaus. Agents in agriculture, homemaking and junior work are co-operatively employed by the Massachusetts Agricultural College, the United States Department of Agriculture and the county. The residents of the county are consulted in community groups as to the work to be done, and then all assistance which is possible to be secured from the United States Department of Agriculture, the college and the county is brought in to complete successfully the work planned. The work receives its financial support from public funds which are secured from the above co-operating parties and the county commissioners. Private funds in the form of memberships and contributions are also received. The administration of the work in each county is vested in a board of ten trustees who are appointed by the county commissioners, co-operating with representatives of the Extension Service at the College.

ADVISORY WORK WITH INSTITUTIONS AND INDIVIDUALS. — Special effort is made to comply with as many of the requests of the State institutions and

individuals who ask for advice on farm problems as possible. The force of instructors available for this work is at present insufficient to take care of all the demands. Special trips, including visits to a number of the various State institutions, are occasionally made by a group of specialists.

**PUBLICATIONS OF THE EXTENSION SERVICE.** — In addition to the regular circulars and bulletins which announce the various short courses and lines of work mentioned, publications giving timely information on agricultural subjects are issued. Large numbers of helpful circulars and bulletins are annually distributed. A series of bulletins especially for the farm woman is one feature of this work. Reports of the work of the Extension Service, farm account blanks, boys' and girls' club circulars, lists of books, and so forth, may be had upon request.

**CO-OPERATION WITH OTHER ORGANIZATIONS.** — The aim of the Extension Service is to co-operate with existing organizations so far as possible. It is therefore glad to work with local organizations, and welcomes suggestions from town officers, local granges, farmers' clubs, women's clubs, Y. M. C. A.'s, Y. W. C. A.'s, boards of trade, village improvement societies, teachers, clergymen, librarians and others interested in agriculture and country life, as to the needs and methods best adapted to the meeting of these needs.

**INFORMATION BY CORRESPONDENCE.** — Besides the activities mentioned, hundreds are helped through personal visits to farms, and still larger numbers through letters of inquiry, which always receive the most careful attention from every department of the institution.

Pamphlets and bulletins are sent free to all who apply for them, and any who desire such help as has been mentioned should address the Director of the Extension Service, Massachusetts Agricultural College, Amherst, Mass.





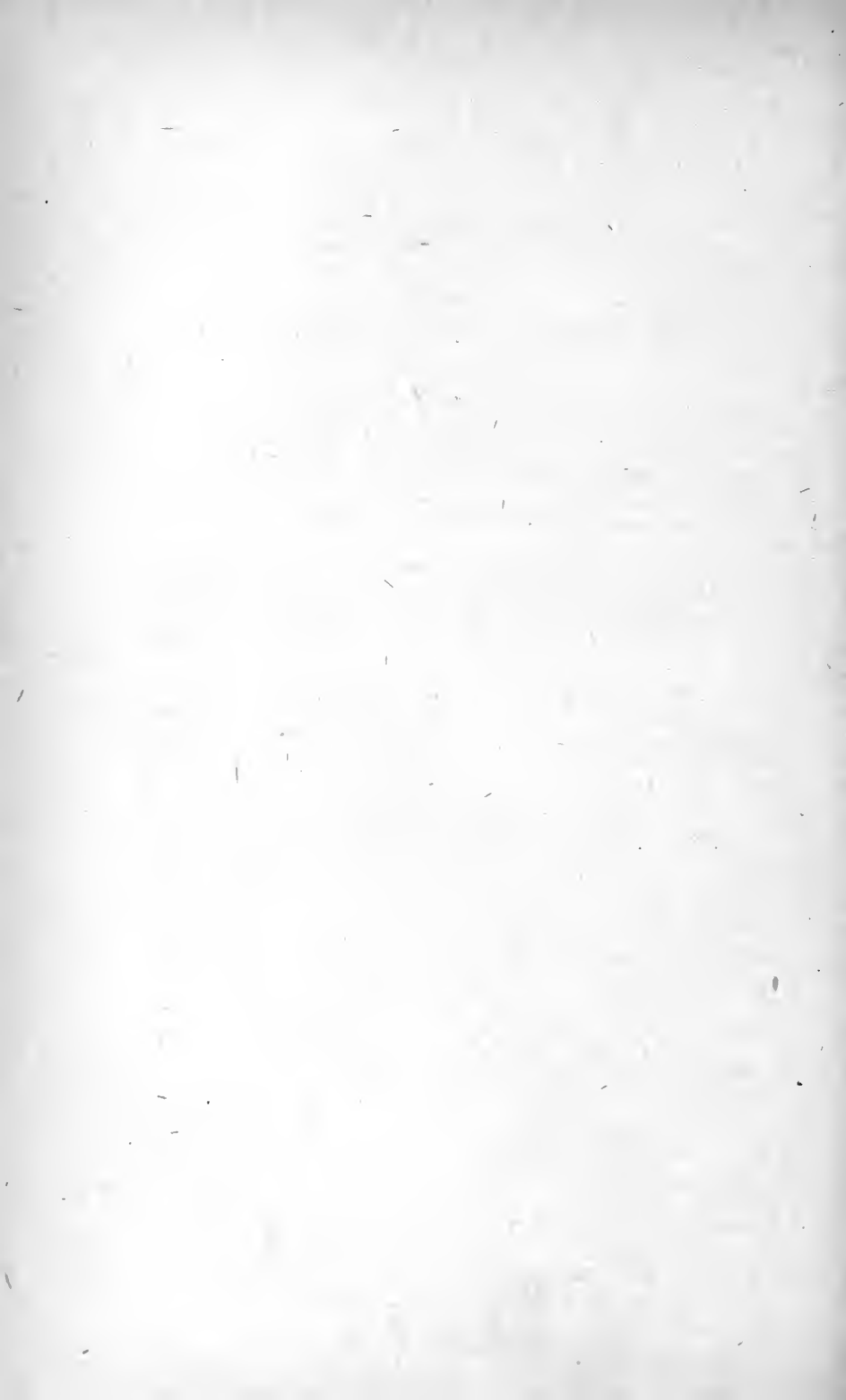
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# GENERAL INFORMATION

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## GENERAL INFORMATION.

### A. FINANCIAL AND ADMINISTRATIVE.

#### Student Expenses.

**TUITION.**<sup>1</sup> — Tuition is free to residents of Massachusetts. Students who are not residents of Massachusetts are charged a tuition fee of \$60 a year. The tuition charged persons not citizens of the United States is \$120 a year. Students entering from Massachusetts are required to file with the president a statement signed by either town or city clerk stating that the applicant's father is a legal resident of Massachusetts; a similar statement is required of those entering from other States.

All students entering the college for the first time as undergraduates or two year students are charged a matriculation fee of \$5, which in event of a student leaving the institution shall, if all bills due the college are paid, be remitted, or which shall upon graduation be considered as payment for the diploma.

**DORMITORIES AND BOARD.** — The college has dormitory accommodations for about 62 men students. The rooms in the dormitories are occupied by the upper classmen, hence new students find it necessary to room in private houses. The rooms in the college dormitories are unfurnished; for the most part they are arranged in suites of three, — one study room and two bedrooms. These rooms are heated by steam and lighted by electricity; they are cared for by students occupying them. The dormitory rent for each person varies from \$39 to \$66 a year. The rent for furnished rooms in private houses ranges from \$1 to \$4 a week for each occupant. Correspondence in regard to rooms should be addressed to the dean of the college.

Board may be obtained at the college dining hall. At present, the price of board there is \$7 a week.

#### Expenses.

The necessary college expenses are estimated as follows: —

Tuition: citizens of Massachusetts, free; other citizens of the United States, \$60 a year; foreigners, \$120 a year.

	Low.	High.
Matriculation fee, first year, . . . . .	\$5 00	\$5 00
Room in college dormitories or in private houses, . . . . .	39 00	110 00
Board, \$7 per week, . . . . .	252 00	252 00
Laundry, 50 to 85 cents a week, . . . . .	18 00	30 00
Laboratory fees, . . . . .	5 00	25 00
Books, stationery and miscellaneous items, . . . . .	31 00	53 00
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	\$350 00	\$475 00

<sup>1</sup> This statement applies to those registering as regular or two-year students.

OTHER EXPENSES.—Prospective students should understand that the above estimates cover expenses which may be called strictly college expenses, and that there are other financial obligations voluntarily placed upon students which they should expect to meet. Chief among these are class assessments and taxes levied for maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, etc. Such expenses vary from \$15 to \$30 a year. Additional financial responsibility is also assumed by students joining a fraternity or entering into other social activities of the college. Students rooming in college dormitories are obliged to equip their own rooms with furniture. The college assumes no responsibility in regard to the safe keeping of student property either during the college term or vacations, except under such special arrangement as may be made with the treasurer. Besides the amount necessary for clothes and traveling, the economical student will probably spend between \$325 and \$450 per year.

#### INITIAL CHARGES.

At the opening of the college year, before students are registered in their classes, the following charges are payable at the treasurer's office:—

	Freshmen.	Sophomores.	Juniors and Seniors.
Matriculation fee, . . . . .	\$5 00	—	—
Board (if at college dining hall) four weeks in advance,	28 00	\$28 00	\$28 00
Assessment for support of Social Union, . . . .	1 50	1 50	1 50
Laboratory fees, . . . . .	5 00	5 00	2 00-10 00
Room rent (if in college dormitory), . . . .	—	—	12 00-20 00
Student tax for support of athletics, <sup>1</sup> . . . .	4 00	4 00	4 00
Student tax for support of nonathletic activities, <sup>1</sup> .	2 50	2 50	2 50

<sup>1</sup> While this is not essentially a college charge, the treasurer of the college acts as collector for the student activity, and all students are expected to make the payment as indicated. The subscription price of the "Collegian" is fixed by the managers; the amount of athletic tax by vote of the student body.

#### LABORATORY FEES.

The principles observed in establishing laboratory fees are the requirement that students pay for those materials actually used which cannot be supplied by the individual, and that the laboratory fees include a charge sufficient to guard against wanton waste and breakage. Fees may be established for any course without previous announcement. At present, the fees charged are as follows:—

Agronomy:—	Per Term.
Course 1, 1, . . . . .	\$1 50
Course 27, 3, . . . . .	2 00
Course 50, 1, . . . . .	2 50
Course 51, 3, . . . . .	2 50
Course 75, 1, . . . . .	2 00
Course 77, 2, . . . . .	2 50
Course 78, 3, . . . . .	2 50

## Animal husbandry:—

Per Term.

Course 1, . . . . .	\$1 00
Course 25, 1, . . . . .	1 50
Course 26, 2, . . . . .	1 50
Course 75, 1, . . . . .	1 50
Course 78, 2, . . . . .	1 00

## Dairying:—

Course 50, 1, . . . . .	2 50
Course 51, 3, . . . . .	2 50
Course 75, 2, . . . . .	2 00
Course 76, 3, . . . . .	3 00
Course 77, 1, . . . . .	2 50

## Farm management:—

Course 75, 1, . . . . .	1 50
Course 76, 1, . . . . .	1 50

## Poultry husbandry:—

Course 51, 1, . . . . .	2 50
Course 53, 3, . . . . .	3 00
Course 55, 3, . . . . .	2 50
Course 76, 1, . . . . .	2 00
Course 77, 1, . . . . .	2 00

## Rural engineering:—

Course 25, 1, . . . . .	1 50
Course 26, 2, . . . . .	1 50
Course 75, 1, . . . . .	1 50
Course 77, 2, . . . . .	1 50
Course 78, 3, . . . . .	1 50

## Floriculture:—

Course 50, 1, . . . . .	2 50
Course 51, 2, . . . . .	2 50
Course 52, 3, . . . . .	2 50
Course 53, 1, . . . . .	2 50
Course 75, 1, . . . . .	2 00
Course 76, 2, . . . . .	2 00
Course 77, 2, . . . . .	2 50
Course 78, 3, . . . . .	2 50

## Forestry:—

Course 50, 1, . . . . .	2 00
Course 51, 2, . . . . .	3 00
Course 75, 1, . . . . .	4 00

## Landscape gardening:—

Course 50, 1, . . . . .	2 50
Course 51, 2, . . . . .	2 50
Course 52, 3, . . . . .	2 50
Course 76, 2, . . . . .	3 00
Course 77, 3, . . . . .	3 00
Course 80, 1, . . . . .	3 00
Course 81, 2, . . . . .	3 00
Course 82, 3, . . . . .	3 00

## Vegetable gardening:—

Course 50, 3, . . . . .	2 00
Course 51, . . . . .	2 00
Course 52, . . . . .	2 00
Course 53, . . . . .	2 00
Course 75, 1, . . . . .	3 00
Course 76, 2, . . . . .	2 00

**Homology: —**

[illegible]

Drawing: —

[illegible]

Botany:—

[illegible]

Entomology:—

[illegible]

## Chemistry: 1 —

[illegible]

<sup>1</sup> An additional deposit of \$1 for Courses 1 to 6, inclusive, and \$2 for Courses 25 to 95, will be required to cover individual breakage. In case the laboratory breakage does not equal the deposit, the balance will be refunded.

## Per Term.

[illegible]

Mathematics and engineering: —

[illegible]

**Microbiology: —**

[illegible]

Physics: —

[illegible]

Veterinary science: —

[illegible]

Zoölogy and geology:—

[illegible]

**Rural journalism: —**

[illegible]

	Per Term.
Music (each course), . . . . .	\$3 00
Rural home life: —	
Courses 25, 26, 27, . . . . .	1 50
Courses 50, 51, 52, . . . . .	4 00

### Rooms.

Students are expected, as far as possible, to occupy rooms in the college dormitories. Students who do not live in the college dormitories must secure rooms approved by the college. The assignment of rooms, and the general supervision of the housing of students, is in charge of the dean. The inspection of student quarters is in charge of the commandant. At the end of each college year all unoccupied rooms will be thrown open for selection, and will be assigned to students according to classes.

### Living Accommodations for Women Students.

Women students attending the college live in a dormitory provided for them, and take their meals at Draper Hall, which is located a short distance from the women's dormitory. The women's dormitory accommodates 98 girls, and is furnished.

### Student Aid.

**SELF HELP.** — Many students are obliged to find work of some sort to earn their way through college. A few men have met their entire expenses in this manner, many more have paid a large part of their expenses, and many have earned a small proportion of the cost of their college education; but the college recommends that no new student enter without having at least \$150 and preferably \$250 with which to pay his way until he can establish himself in some regular work. The college does not encourage students to enter without money in the expectation of earning their way entirely. The ordinary student will find it better either to work and accumulate money before coming to college, or to take more than four years in completing his college course, or, instead, to borrow money sufficient to carry him through. No student should undertake work that interferes with his studies, and students should understand that, owing to the large number of applications for employment, no one man can receive a large amount of work at the college. A number of students find opportunities for earning money without depending upon the college to furnish them with work.

So far as possible needy students will be employed in some department of the college. The divisions of agriculture and horticulture usually afford the most work, although there are several permanent janitorships available for students, and twenty or more students are employed at the dining hall.

Application for student labor should be made directly to Kenyon L. Butterfield, president of the college. Applicants are required to present statements from parent or guardian and from a public official or other responsible person of the town or city in which they reside, explaining the necessity of the applicant's need of assistance. Students whose department or class work is not satisfactory are not likely to be continued in student labor. The most desirable and responsible positions are naturally assigned to those needy students who have been in the institution longest and who have dem-



onstrated their need and ability. Students, therefore, may find it rather difficult to obtain all the work they desire during their freshman year; as a matter of fact, however, any student who is capable of doing a variety of things, and who is a competent workman, usually finds little difficulty in obtaining all the work that he can do from the outset.

**SPECIAL NOTICE TO NEEDY STUDENTS.** — In the last few years the demand for paid labor on the part of new students has far exceeded the amount of employment that the college can offer. The college cannot promise work to any student, particularly to freshmen; it accordingly urges prospective students who are dependent entirely upon their own efforts not to undertake the course before they have earned enough money to carry them through, or nearly through, the first year.

### **Student Accounts.**

The following rules are enforced concerning student accounts: —

No student will be allowed to graduate until all bills due the institution from him are paid.

College charges, such as room rent, laboratory fees and tuition, must be paid in advance, at the beginning of each term. This rule is strictly adhered to, and no student will be allowed to complete his registration until such payments are made.

Every student boarding at Draper Hall is required to pay at the beginning of each term at least one month's board in advance; and no student will be allowed to continue to board at Draper Hall if at any time during the term he is more than one week in arrears in his payment for board.

All money due for student labor shall at the discretion of the treasurer of the college be applied on account toward any bills that a student may owe to the institution.

### **Student Relations.**

The customary high standard of college men in honor, manliness, self-respect and consideration for the rights of others constitutes the standards of student deportment.

Any student known to be guilty of dishonest conduct or practice must be reported by the instructor to the president for discipline.

The privileges of the college may be withdrawn from any student at any time, if such action is deemed advisable.

It should be understood that the college, acting through its president or any administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may also be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences ("cuts"). According to the rules a student is allowed a certain percentage of absences from class and other exercises. This permission, which implies a privilege and not a right, may be withdrawn at any time for any cause.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet, if in

the judgment of the college authorities a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct. Prospective students or their parents may, upon application, obtain a copy of the faculty rules governing student relations to the college.

### **Infirmary.**

The college maintains an infirmary for the care of sick or injured students. The buildings now available for this purpose are quite inadequate for the needs of the institution, and it is hoped that in the near future other buildings of this kind may be erected and the general equipment somewhat amplified. At present two small buildings, built especially for hospital purposes, are used for the infirmary.

The following statement outlines the plan followed in the management of the infirmary with respect to students:—

#### **MANAGEMENT OF THE INFIRMARY.**

##### *Supervision.*

1. The infirmary is under the *general supervision* of Prof. Charles E. Marshall who is designated as Supervisor of the Infirmary. Miss Grace Charman the resident nurse, with Miss Marguerite Davis as assistant resident nurse, is in *immediate charge* of the infirmary.

##### *Use of Infirmary.*

2. Students are urged to go to the infirmary at any time that they are in need of the services rendered by the resident nurse or by a town physician. Inasmuch as the physical director gives special attention to all student diseases, it is to be expected that the majority of the students will go to the infirmary at his suggestion. This understanding, however, should in no way deter students from going to the infirmary voluntarily at any time.

##### *General Health.*

3. Students are urged to consult the physical director or the resident nurse immediately when signs of physical disorder appear. Severe attacks of cold or other forms of illness can usually be avoided if treatment is administered in the incipient stage. The purpose of the infirmary is to help maintain the general good health of the students, as well as to furnish a suitable place for professional attention in cases of severe illness or accident.

##### *General Fee.*

4. The infirmary fee will be at the rate of \$2 a day, and will be charged when one or more meals are obtained at the infirmary, or when the student remains at the infirmary for one or more nights. A nominal charge will be made to out patients for miscellaneous treatment of a minor character.

*Additional Expenses.*

5. In addition to the fee charged, as specified in paragraph 4, the following additional expenses will be charged to the patient:—

(a) *Nurses.*—In case a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient. Such a nurse will be under the general supervision of the resident nurse.

(b) *Professional Service.*—If a student requires medical attention by a physician, he will be required to select his physician and become responsible for fees charged by the physician.

(c) *Supplies.*—Special medical supplies prescribed by a physician or nurse will be charged to the patient.

(d) *Laundry.*—Expense for personal laundry incurred by students while in the infirmary will be charged to the individual student.

**B. COLLEGE ACTIVITIES.****General Exercises.**

Chapel exercises are held two mornings each week. On Wednesday an afternoon assembly is held, to which some prominent layman or professional man is invited to speak. The object of these assemblies is to bring to the students discussions of topics of present-day interest. A special chapel service on Sunday is usually held during the winter months. Students are required to attend these general exercises, although the president is authorized to excuse from chapel any student who may object to attendance thereon because of his religious scruples, provided his request for excuse therefrom is endorsed by his parent or guardian.

**Student Activities.**

A large number of student organizations furnish opportunity to students for work and leadership.

The Massachusetts Agricultural College Social Union was established about ten years ago. All students become members of the union by paying a small fee. The union is designed to become the center of student interests. In North College it has a trophy room and a large lounging room for music, reading and study; in the basement of this building there is also a game room for pool and billiards. In the fall and winter months the union gives a series of entertainments, free to students and faculty.

The College Senate is composed of representatives of the junior and senior classes. This body serves as a general director of undergraduate conduct, and represents before the faculty the interests of the student body.

The Young Men's Christian Association is active both socially and religiously. A Catholic club has also been organized.

The musical organizations include an orchestra, a mandolin club and a glee club. These furnish music for college meetings, and occasionally give concerts at the college and at other places. A military band is maintained as part of the cadet corps.

A dramatic club has been organized, and each year presents a play.

The Public Speaking Council represents the students' interest in debate and oratory.

The Athletic Association represents in the college the interests of football, baseball, track, hockey and basket ball.

A rifle club has been organized for a few years. Teams representing this club have repeatedly won the intercollegiate championship of the country, both in indoor and outdoor contests.

The college publications are the "Massachusetts Collegian" published weekly by the student body, and the "Index," published annually by the members of the junior class.

The Stockbridge Club is an organization of students especially interested in practical agriculture and horticulture. Regular meetings are addressed by outside speakers, and members present papers and engage in discussions.

Clubs also exist in the Departments of French, Entomology, Floriculture, Landscape Gardening, Zoölogy and Agricultural Economics.

There has recently been organized a Collegiate Country Life Club, the membership of which is composed of faculty and students who are particularly interested in the study of country life problems.

A nonathletics student activities board, composed of alumni, faculty and students, has charge of the finances, schedules, etc., of the musical clubs, dramatic club and student publications.

## C. ACADEMIC AND DEPARTMENTAL.

### Degrees.

Those who complete a four-year course receive the degree of bachelor of science. The fee for graduation from the college is \$5.

Graduate students who complete the assigned courses will receive the degree of master of science upon the payment of a fee of \$10. Credit may sometimes be allowed towards this degree for teaching or other advanced work done in some department of the college.

Graduate students who complete the required three-year course of study, and present a satisfactory thesis, will be granted the degree of doctor of philosophy.

Those to whom degrees are awarded must present themselves in person at commencement to receive them. No honorary degrees are conferred.

The honorary fraternity of Phi Kappa Phi has a chapter at the agricultural college. Students are elected to membership to this fraternity on the basis of scholarship. Elections are made from the highest tenth of the senior class who have attained an average grade of at least 85 per cent during their college course.

### Prizes.

Prizes are given annually in several departments for excellence in study or for other special achievement. Prizes offered in 1920 were: —

AGRICULTURE. — The Grinnell prizes, given by Hon. William Claflin of Boston in honor of George B. Grinnell, Esq., of New York, for excellence in theoretical and practical agriculture. Three prizes, \$25, \$15, \$10. The contest is open to those senior students whose record on the registrar's books shows an average standing of 80 or above for the technical work taken in the Divisions of Agriculture and Horticulture during the junior and senior years.

**BOTANY.** — The Hills prizes, given by Henry F. Hills of Amherst, amount to \$35 annually. Competition is open to members of the senior, junior and sophomore classes as follows: for the best herbarium, \$20; for the second best herbarium, \$15. No collection deemed unworthy of a prize will be considered.

**PUBLIC SPEAKING.** — The Burnham prizes are awarded as follows: to the students delivering the best and second best declamations in the Burnham contest, \$15 and \$10, respectively. The preliminary contests in declamation are open, under certain restrictions, to freshmen and sophomores.

The Flint prizes are awarded as follows: to the students delivering the best and second best orations in the Flint contest, a gold medal and \$30 and \$15, respectively. The preliminary contests in oratory are open, under certain restrictions, to all regular students.

The prizes in debate are awarded as follows: to each of the three students ranking highest in the annual debating contest, a gold medal and \$15. The preliminary contests in debate are open, under certain restrictions, to all regular students.

#### Awards and Prizes, 1920.

**GRINNELL PRIZES.** — The Grinnell prizes, given by the Hon. William Claflin of Boston in honor of George B. Grinnell, Esq., of New York, to those members of the senior class who pass the best, second best and third best examinations, oral and written, in theoretical and practical agriculture, were awarded as follows: —

First prize, \$25, Clinton J. Daggett.

Second prize, \$15, George B. Woodward.

Third prize, \$10, Ralph W. Hurlburt.

**PUBLIC SPEAKING.** — The Burnham prizes were awarded to the students delivering the best and second best declamations, as follows: —

First prize, \$15, Harry A. Erysian, 1922.

Second prize, \$10, Payson T. Newton, 1923.

**DEBATING PRIZES.** — Debating prizes were awarded to the students making the best and second best presentations at the interclass debate, as follows: —

First prize, \$15, Robert F. Martin, 1923.

Second prize, \$10, Willis Tanner, 1922.

**FLINT PRIZES.** — The Flint prizes were awarded to the students delivering the best and second best orations, as follows: —

First prize, \$20, Harry A. Erysian, 1922.

Second prize, \$15, John A. Crawford, 1920.

**HILLS PRIZE.** — A prize of \$20 for the best herbarium was awarded to Otto Degener, 1922.

**MILITARY HONORS.** — Henry E. Lyons, Cadet officer, was granted the military diploma, was recommended for appointment in the Officers' Reserve Corps, United States Army, and was reported to the Adjutant-General of the Commonwealth of Massachusetts as being qualified for a commission in the National Guard.

**STATE TEACHER'S CERTIFICATE.** — The following persons, having fulfilled the requirements for a Massachusetts State teacher's certificate, were recom-

mended for the same to the State Board of Education by the Dean and the Department of Agricultural Education: —

Daniel W. Belcher.

John A. Crawford.

Herbert M. Emery.

Arthur L. Frellick.

James J. Window.

SOUTHERN ALUMNI BASEBALL CUP. — The Southern Alumni baseball cup was awarded to Herbert L. Collins, 1922, the best all-round ball player during the season of 1920.

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DEGREES CONFERRED AND  
ROLL OF STUDENTS

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## DEGREES CONFERRED—1920.

### MASTER OF SCIENCE (M.Sc.).

Prince, Arthur Leslie, A.B., Clark College, . . . . .	Webster.
Purrington, James Alson, B.S., New Hampshire College of Agriculture and the Mechanic Arts, . . . . .	Hopkinton, N. H.

### BACHELOR OF SCIENCE (B.Sc.).

Apsey, George Wills, Jr., . . . . .	Winchester.
Babbitt, George King, as of the class of 1918, . . . . .	Bridgewater, Conn.
Bacon, Milo Roderick, . . . . .	Leominster.
Baker, Henry Raymond, as of the class of 1918, . . . . .	Amherst.
Baker, William Alphonso, as of the class of 1919, . . . . .	Melrose.
Ball, Harry Abraham, . . . . .	Bridgewater.
Batchelder, Stewart Putnam, as of the class of 1919, . . . . .	North Reading.
Beauregard, Winfield Scott, . . . . .	Framingham.
Belcher, Daniel Webster, . . . . .	North Easton.
Berman, Harry, . . . . .	Holyoke.
Binks, Frank Joseph, as of the class of 1918, . . . . .	Maynard.
Boardman, Charles Meade, . . . . .	Amherst.
Boyce, Alan Freeman, as of the class of 1919, . . . . .	Melrose.
Buffum, Eliot Mansfield, . . . . .	Waban.
Burns, Allan Melville, Jr., . . . . .	Taunton.
Burton, Lee Williams, as of the class of 1919, . . . . .	Plainville.
Campbell, George Murray, . . . . .	Baltimore, Md.
Card, Ralph Hunter, . . . . .	Somerville.
Carleton, John Foxcroft, . . . . .	East Sandwich.
Cassidy, Morton Harding, . . . . .	East Boston.
Chambers, Roger James, as of the class of 1918, . . . . .	Dorchester.
Chase, Malcolm Willis, . . . . .	Amesbury.
Clapp, Augustus Warren, as of the class of 1919, . . . . .	East Braintree.
Clarridge, Fred William, . . . . .	Milford.
Clough, Alfred Arnold, . . . . .	Wollaston.
Cole, Frédéric Eugene, Jr., . . . . .	South Portland, Me.
Crafts, Gordon Burnham, . . . . .	Manchester.
Crawford, John Alexander, . . . . .	Allston.
Crowe, Charles, as of the class of 1919, . . . . .	Norwich, Conn.
Daggett, Clinton Jones, . . . . .	Albany, N. Y.
Delahunt, John Kersey, . . . . .	Boston.
Derick, Glendon Robert, . . . . .	Clinton.
Dewing, Warren Montague, . . . . .	Kingston.
Doucette, Charles Felix, . . . . .	Melrose.
Dowd, William Lawrence, as of the class of 1918, . . . . .	Amherst.
Earley, Marion Edith, . . . . .	Redlands, Cal.
Emery, Herbert Martin, . . . . .	Newburyport.
Faneuf, Leo Joseph, as of the class of 1918, . . . . .	West Warren.
Fellows, Harold Carter, as of the class of 1918, . . . . .	Peabody.
Frellick, Arthur Lester, as of the class of 1918, . . . . .	Everett.
Fuller, Camille Baldwin, as of the class of 1918, . . . . .	Quincy.
Gifford, Flavel Mayhew, as of the class of 1918, . . . . .	West Tisbury.
Glavin, William Francis, as of the class of 1919, . . . . .	Wenham.
Goodridge, George Lucien, as of the class of 1918, . . . . .	Melrose.

Goodwin, William Irving, as of the class of 1918,	Bradford.
Gordon, Frederick George, as of the class of 1918,	Plymouth.
Graff, Leland Sprague,	Newton Center.
Graves, Carlisle Ferrin,	Stamford, Conn.
Grayson, Forrest, as of the class of 1918,	Milford.
Green, Lynn,	Schenevus, N. Y.
Hamlin, Hazen Wolcott,	North Amherst.
Harrington, Harold Leon,	Lunenburg.
Harvey, Ebenezer Erskine,	Washington, D. C.
Hawley, Robert Dorman, as of the class of 1918,	Springfield.
Hill, John Farron,	Egypt.
Holloway, John William,	Taunton.
Holmes, Robert Palmer, as of the class of 1918,	Agawam.
Horne, Robert Sanderson,	Derry Village, N. H.
Howard, Arthur Merchant, as of the class of 1918,	Pittsfield.
Howe, Albert Edward, as of the class of 1918,	Needham.
Hurlburt, Ralph Walter, as of the class of 1918,	Ashley Falls.
Jakeman, Brooks Franklin,	Wakefield.
Johnson, Lawrence Wilhelm,	Avon.
Littlefield, John Edwin,	West Lynn.
Lothrop, Earle Daniel,	West Bridgewater.
Luce, William Alan,	West Boylston.
Lyons, Henry Egmont,	Cambridge.
MacLeod, Guy Franklin,	Lowell.
Maginnis, John Joseph, as of the class of 1918,	Lawrence.
Maples, James Comly,	Port Chester, N. Y.
Marshall, Max Skidmore, as of the class of 1918,	Amherst.
Mather, Fred, as of the class of 1917,	Amherst.
Meserve, Albert Wadsworth,	Framingham.
Millard, Helen Stanley,	Great Barrington.
Mitchell, Theodore Bertis, as of the class of 1918,	Needham.
Morse, Maurice, as of the class of 1919,	Dorchester.
Moynihan, Patrick Joseph, as of the class of 1918,	Holyoke.
Novitski, Joseph Francis,	Amherst.
Oertel, August Leonard, as of the class of 1918,	South Hadley Falls.
Peckham, William Harold,	Newport, R. I.
Perry, Errol Clinton, as of the class of 1919,	Acushnet.
Pike, Chester Arthur,	Springfield.
Prée, Karl Julius, as of the class of 1919,	Brookline.
Quadland, Howard Preston,	North Adams.
Radio, Philip Adna,	Florence.
Redding, George Kenneth,	Melrose.
Roberts, Mark Anthony, as of the class of 1919,	Dorchester.
Robertson, William Fenton,	Framingham.
Sanborn, Joseph Raymond,	North Amherst.
Sanderson, Ralph Hemenway,	Waltham.
Sawyer, Wesley Stevens, as of the class of 1918,	Boston.
Simmons, Lester Winslow,	Dighton.
Skinner, Everett Hamilton, as of the class of 1919,	West Upton.
Smith, George Alfred,	Whitinsville.
Smith, Raymond Newton,	Plainville.
Smith, Susan Almira,	Great Barrington.
Spaulding, Harold Edwin,	Milford.
Stedman, Ralph Shaw,	Springfield.
Stowe, Raymond Timothy, as of the class of 1918,	Scitico, Conn.
Sullivan, Walter Mitchell,	Lawrence.
Swift, Raymond Walter, as of the class of 1918,	North Amherst.
Taylor, Elliot Hubbard,	Shelburne.
Thayer, Weston Cushing, as of the class of 1918,	Hingham.
Tirrell, Loring Vinson, as of the class of 1919,	South Weymouth.
Urquhart, John Wardrop,	East Walpole.
Williams, Allan Carruth,	Rockland.
Window, James Joseph, as of the class of 1919,	Springfield.
Woodbury, Ray Willard, as of the class of 1918,	Newburyport.

Wooding, Paul Bennett, as of the class of 1918, . . . .	Yalesville, Conn.
Woodward, George Blossom, . . . . .	Albany, N. Y.
Worthley, Harlan Noyes, as of the class of 1918, . . . .	Amherst.
Wright, Stuart Eldridge, . . . . .	Raynham Center.

## BACHELOR OF SCIENCE, HONORIS CAUSA.

Baker, Foster Konneth, . . . . .	Fairhaven.
Clapp, Roger Francis, . . . . .	Salem.
Coderre, Ernest Laurier, . . . . .	Southbridge.
Harwood, Ralph Wallace, . . . . .	Barre.
Heffron, Paul John, . . . . .	Sherborn.
Norcross, Gardner Clyde, . . . . .	Brimfield.
Pend, Allan Leon, <sup>1</sup> . . . . .	Holliston.
Richardson, Stephen Morse, . . . . .	Montague.
Sampson, Fred Bucknam, . . . . .	Fall River.

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<sup>1</sup> Deceased.

## REGISTRATION, 1920-21.

### GRADUATE STUDENTS.

Avery, Roy C.,	New York City.
B.S., Connecticut Agricultural College.	
Baldwin, C. H.,	Cummington.
A.M., Dallas College.	
B.D., Hartford Theological Seminary.	
Bonnell, Anna Vreeland,	Elizabeth, N. J.
A.M., Mt. Holyoke College.	
Buchanan, Walter Gray,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Campbell, Malcolm D.,	Raynham.
B.Sc., Worcester Polytechnic Institute.	
Campbell, Walter,	Springfield.
A.M., Princeton University.	
Clark, Dorothy Porter,	Newton.
B.A., Wellesley College.	
Coleman, Elizabeth,	Scranton, Pa.
A.B., Smith College.	
Dooley, Thomas P.,	Dorchester.
B.Sc., Massachusetts Agricultural College.	
Drain, Daniel Brooks,	Amherst.
B.Sc., Ohio State University.	
Drexel, Richard Jacob,	Tifton, Ga.
B.S.A., Georgia State College.	
Elder, Thomas Edwin,	Mount Hermon.
B.Sc., Cornell University.	
Emery, Herbert M.,	Newburyport.
B.Sc., Massachusetts Agricultural College.	
Faneuf, Ambrose,	West Warren.
B.Sc., Massachusetts Agricultural College.	
Farrar, Harry Allen,	Middleton.
B.Sc., Middlebury College.	
Folsom, Josiah C.,	South Hadley.
B.Sc., Massachusetts Agricultural College.	
Frellick, Arthur L.,	Everett.
B.Sc., Massachusetts Agricultural College.	
Frellick, Ralph S.,	Everett.
B.S., Franklin College.	
French, Rowland B.,	Haverhill.
B.S., Dartmouth College.	
Gagnon, Aime,	Laprairie, P. Q., Can.
B.A., Laval University.	
Garvey, Mary Ellen M.,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Gifford, George Endicott,	Middleton.
B.S., Boston University.	
Glover, Theodore W., Jr.,	North Easton.
B.Sc., Massachusetts Agricultural College.	
Gould, Charles H.,	Amherst.
B.Sc., Massachusetts Agricultural College.	
Harris, Roy Dudley,	Middlebury, Vt.
B.Sc., Middlebury College.	

Hood, Egerton Gibson,	. . . . .	Macdonald College, P. Q., Can.
B.S.A., Ontario Agricultural College.		
Julian, Arthur H.,	. . . . .	Amherst.
B.A., Northwestern University.		
Lieber, Conrad H.,	. . . . .	Jamaica Plain.
B.Sc., Massachusetts Agricultural College.		
Mather, Fred C.,	. . . . .	Amherst.
B.Sc., Massachusetts Agricultural College.		
Merritt, L. A.,	. . . . .	Williamsburg.
B.S., Trinity College.		
Montesanto, John Emile,	. . . . .	Melrose.
B.A., International College, Smyrna, Turkey.		
Morin, Adrien,	. . . . .	Saint-Celestin, P. Q., Can.
B.S.A., École d'Agriculture de Ste. Anne de la Pocatière, Can.		
Neill, James A.,	. . . . .	Clarion, Pa.
B.S., Allegheny College.		
Nirodni, B. S.,	. . . . .	Byndoor, India.
B.A., University of Madras, India.		
O'Brien, Daniel W.,	. . . . .	Natick.
B.Sc., Massachusetts Agricultural College.		
Perrins, Arthur W., Jr.,	. . . . .	Enfield.
A.B., Harvard University.		
Porter, Randall R.,	. . . . .	Columbia, Conn.
B.S., Wesleyan University.		
Rand, Helen Margaret,	. . . . .	Fairfield, Idaho.
A.M., Radcliffe College.		
Sanborn, Joseph Raymond,	. . . . .	North Amherst.
B.Sc., Massachusetts Agricultural College.		
Sanctuary, Wm. Crocker,	. . . . .	Morrisville, N. Y.
B.S., Massachusetts Agricultural College.		
Stratford, Reginald Kilmaster,	. . . . .	Toronto, Ont., Can.
Ontario Agricultural College (Toronto University).		
Taylor, Raymond Stevens,	. . . . .	Newton, Pa.
B.Sc., Pennsylvania State College.		
Thelin, Guy,	. . . . .	Sioux Falls., S. D.
B.Sc., South Dakota State College.		
Towle, Dorothy,	. . . . .	Westfield.
B.A., Mt. Holyoke College.		
Ward, Charles L.,	. . . . .	Andover.
B.Sc., Harvard University.		
Watson, Esther,	. . . . .	Boston.
B.S., Teachers' College, Columbia University.		
Wells, Reuben F.,	. . . . .	Hatfield.
B.A., Amherst College.		
Wolfe, Benjamin Franklin,	. . . . .	Columbia City, Ind.
B.S.A., Purdue University.		

*Enrolled in 1919-20, after List was published.*

Mikami, S.,	. . . . .	Tokyo, Japan.
Hokkaido Imperial University.		
Torrey, Hamilton,	. . . . .	Springfield.
B.Sc., University of Pennsylvania.		
Tower, Alfred L.,	. . . . .	Sheffield.
B.Sc., Massachusetts Agricultural College.		

CLASS OF 1921 (SENIORS).

Alger, James Warren, <sup>1</sup>	. . . . .	Reading, . . . . .	Kappa Sigma.
Allen, Harold Kenneth,	. . . . .	Belchertown, . . . . .	Belchertown.
Allen, Henry Vaughn, <sup>1</sup>	. . . . .	Arlington, . . . . .	Phi Sigma Kappa.
Anderson, Charles Henry,	. . . . .	Medford, . . . . .	Theta Chi.
Armstrong, Philip Brownell,	. . . . .	Rutherford, N. J., . . . . .	Phi Sigma Kappa.

<sup>1</sup> Work incomplete.

Bailey, William, Jr., . . . .	Williamstown, . . . .	Stockbridge Hall.
Baker, Louis Eliot, . . . .	Salem, . . . .	13 South College.
Baker, Russell Dexter, . . . .	Oxford, Me., . . . .	Lambda Chi Alpha.
Ball, Lorin Earl, . . . .	Amherst, . . . .	Q. T. V.
Bögholt, Carl Miller, . . . .	Newport, R. I., . . . .	Q. T. V.
Boynton, Raymond Woods, . . . .	Framingham, . . . .	Alpha Sigma Phi.
Brigham, John Dexter, <sup>1</sup> . . . .	Sutton, . . . .	16 South College.
Brown, Paul Wilfred, . . . .	Fiskdale, . . . .	Lambda Chi Alpha.
Bunker, Carroll Wooster, . . . .	Dorchester, . . . .	Q. T. V.
Calhoun, Salteau Frederick, . . . .	Brookline, . . . .	The Davenport.
Cameron, Viola Mary, <sup>1</sup> . . . .	Amherst, . . . .	Amherst, R. F. D. 2.
Cascio, Peter Joseph, . . . .	Willimantic, Conn., . . . .	Sigma Phi Epsilon.
Coombs, Roger Conklin, . . . .	Peabody, . . . .	Sigma Phi Epsilon.
Cooper, Lawrence Melville, <sup>1</sup> . . . .	Charlemont, . . . .	Alpha Gamma Rho.
Davenport, Frank Semore, <sup>1</sup> . . . .	Dorchester, . . . .	Alpha Sigma Phi.
Davidson, Donald Gordon, . . . .	Amherst, . . . .	10 Boltwood Avenue.
Davis, Orrin Chester, . . . .	Belchertown, . . . .	Alpha Gamma Rho.
Dean, Herman Nelson, . . . .	Oakham, . . . .	Q. T. V.
Douglass, Donald Churchill, <sup>1</sup> . . . .	Cambridge, . . . .	Phi Sigma Kappa.
Dunbar, Charles Oliver, . . . .	Westfield, . . . .	84 Pleasant Street.
Edman, George William, <sup>1</sup> . . . .	Orange, . . . .	The Davenport.
Evers, Joseph Daniel, . . . .	Malden, . . . .	Sigma Phi Epsilon.
Fletcher, Francis Summers, . . . .	East Lynn, . . . .	Alpha Gamma Rho.
Fuller, Lorenzo, . . . .	Lowell, . . . .	Mathematics Building.
Gaskill, Harland Everett, . . . .	Hopedale, . . . .	Alpha Sigma Phi.
Geer, Herbert Leroy, . . . .	Three Rivers, . . . .	Q. T. V.
Gillette, Nathan Warner, <sup>1</sup> . . . .	Revere, . . . .	Q. T. V.
Gilligan, Gerald Mathew, . . . .	West Warren, . . . .	Kappa Gamma Phi.
Goff, Howard Mason, . . . .	Cambridge, . . . .	Phi Sigma Kappa.
Gould, Robert Meredith, . . . .	Shelburne, . . . .	Q. T. V.
Gray, Irving Emery, . . . .	Woods Hole, . . . .	Alpha Gamma Rho.
Hagar, Joseph Archibald, . . . .	Marshfield Hills, . . . .	Kappa Sigma.
Haskins, Harold Arthur, . . . .	North Amherst, . . . .	North Amherst.
Haslam, Emerson Francis, . . . .	Westwood, . . . .	Theta Chi.
Howard, Frederic, . . . .	Mansfield, . . . .	Lambda Chi Alpha.
Howe, George Cole, . . . .	Amherst, . . . .	81 Pleasant Street.
Hunter, Harold Clayton, <sup>1</sup> . . . .	South Hadley Falls, . . . .	Alpha Sigma Phi.
Hurd, Davis Alden, . . . .	Wellesley Hills, . . . .	French Hall.
Hurd, Gordon Killam, <sup>1</sup> . . . .	Millbury, . . . .	Physics Laboratory.
Iorio, Carlo Antonio, . . . .	Springfield, . . . .	East Experiment Station.
Jones, Robert Lambert, . . . .	Attleboro, . . . .	Q. T. V.
Kendall, Charles Donald, <sup>1</sup> . . . .	Worcester, . . . .	Q. T. V.
Kimball, William Lincoln, . . . .	Orange, . . . .	Phi Sigma Kappa.
King, Starr Margetts, . . . .	Pittsfield, . . . .	Kappa Sigma.
Kirkland, Lyle Lord, . . . .	Chester, . . . .	77 Pleasant Street.
Knight, Frank Edward, . . . .	Brimfield, . . . .	South College.
Labrovitz, Edward Browdy, . . . .	Amherst, . . . .	11 Amity Street.
Lambert, Richard Bowles, . . . .	Gleasondale, . . . .	Lambda Chi Alpha.
Leavitt, Ralph Goodwin, <sup>1</sup> . . . .	Melrose, . . . .	Theta Chi.
Leighton, Arthur Whiting, . . . .	Abington, . . . .	9 Fearing Street.
Lent, Donald Ashford, . . . .	Maynard, . . . .	Alpha Gamma Rho.
Lincoln, Newton Ewell, . . . .	Dorchester, . . . .	Alpha Gamma Rho.
Lockwood, George Russell, . . . .	Waban, . . . .	Theta Chi.
Long, Albert Douglas, . . . .	Amherst, . . . .	Sigma Phi Epsilon.
Mackintosh, Charles Gideon, . . . .	Peabody, . . . .	Phi Sigma Kappa.
Mallon, Charles Hugh, . . . .	East Braintree, . . . .	Phi Sigma Kappa.
Mansell, Elton Jessup, <sup>1</sup> . . . .	Cambridge, . . . .	Phi Sigma Kappa.
Martin, Lawrence Paul, . . . .	Malden, . . . .	Alpha Sigma Phi.
McCarthy, Justin Jeremiah, . . . .	Arlington, . . . .	Phi Sigma Kappa.
Mollen, Richard Adams, . . . .	Cambridge, . . . .	Sigma Phi Epsilon.
Newell, Philip Sanger, . . . .	West Newton, . . . .	Phi Sigma Kappa.
Newton, Edward Buckland, . . . .	Holyoke, . . . .	Commons Club.

<sup>1</sup> Work incomplete.

O'Hara, Joseph Ernest,	Worcester,	8 Kellogg Avenue.
Palmer, Walter Isaiah, <sup>1</sup>	Amherst,	13 South Prospect Street.
Peck, Richard Charles,	Shelburne,	West Experiment Station.
Poole, Harold Walter,	Hudson,	10 South College.
Pratt, Laurence Francis,	North Weymouth,	Q. T. V.
Preston, Everett Carroll,	Dorchester,	20 South College.
Quint, Isador Gabriel,	Roxbury,	13 South College.
Reed, Morris,	Worcester,	14 South College.
Rice, Henry Lawrence,	Somerville,	Kappa Sigma.
Robinson, Philip Luther, <sup>1</sup>	New Bedford,	Alpha Gamma Rho.
Rosoff, Samuel Nathaniel,	Springfield,	13 South College.
Russert, Marion Ruth,	Boston,	Adams House.
Sampson, Howard Jenney, <sup>1</sup>	Fall River,	Theta Chi.
Sanford, Richard Herbert,	Westfield,	Sigma Phi Epsilon.
Slate, George Lewis,	Barnardston,	Alpha Gamma Rho.
Sloan, Kenneth Wilson,	Amherst,	29 North Prospect Street.
Smith, Jonathan Harold,	Roslindale,	Theta Chi.
Smith, Richard Watson, Jr.,	Sylacauga, Ala.,	Q. T. V.
Snow, John Dow,	Arlington,	Phi Sigma Kappa.
Starkey, Robert Lyman,	Fitchburg,	Phi Sigma Kappa.
Stevens, Ralph Shattuck, <sup>1</sup>	Arlington,	Theta Chi.
Stiles, Harry Stephen,	Lynn,	Kappa Gamma Phi.
Tietz, Harrison,	Richmond Hill, L. I., N. Y.,	37 Cottage Street.
Tilson, Reginald Drury,	Whitman,	21 Fearing Street.
Van Lennep, Emily Bird,	Great Barrington,	Adams House.
Waite, Richard Austin,	Middlefield,	Alpha Gamma Rho.
Watkins, Tscharner Degraffenreidt, <sup>1</sup>	Midlothian, Va.,	Kappa Sigma.
Webster, Milton Fuller,	Malden,	Kappa Gamma Phi.
West, Guy Clifford,	Amesbury,	Kappa Gamma Phi.
Zercher, Frederick Kaupp, <sup>1</sup>	Huntington, W. Va.,	Clark Hall.

## CLASS OF 1922 (JUNIORS).

Acheson, Roger Melvin,	New Bedford,	Alpha Gamma Rho.
Andrews, John Hollis,	Vineyard Haven,	15 North College.
Bainton, Hubert Judson, <sup>1</sup>	Hyde Park,	12 North College.
Baker, George Louis,	Amherst,	124 West Street.
Barnard, Kenneth Allen,	Shelburne,	Q. T. V.
Beckwith, Robert Henry,	Wellesley Hills,	Entomological Building.
Bent, Leslie Dana, <sup>1</sup>	Medfield,	Lambda Chi Alpha.
Blakely, Roger Wolcott,	Medford,	3 Hallock Street.
Blanchard, Raymond Stanwood,	Wollaston,	3 North College.
Bromley, Stanley Willard,	Southbridge,	Alpha Gamma Rho.
Buck, Charles Alfred,	Mansfield,	Alpha Gamma Rho.
Burnett, Paul Lapham, <sup>1</sup>	Leicester,	11 South College.
Burnham, Edwin Graham,	Springfield,	Lambda Chi Alpha.
Carey, Edmund Thomas,	Springfield,	Kappa Gamma Phi.
Chapin, Ellis Warren, Jr., <sup>1</sup>	Chicopee Falls,	15 North College.
Chase, Eleanor Frances,	Amesbury,	Adams House.
Clark, Clarence Frederick,	Sunderland,	Q. T. V.
Collins, Donald Keith, <sup>1</sup>	Rockland,	Theta Chi.
Collins, Herbert Laurence,	Arlington,	Sigma Phi Epsilon.
Conant, Luman Binney, <sup>1</sup>	Waltham,	5 South College.
Cook, Frederick Belcher,	Niantic, Conn.,	Commons Club.
Cotton, George Asa, <sup>1</sup>	Woburn,	Sigma Phi Epsilon.
Crawford, Alexander George,	Waverley,	15 South College.
Davis, Harold Sanborn, <sup>1</sup>	Belchertown,	Belchertown.
Degener, Otto, <sup>1</sup>	New York, N. Y.,	The Davenport.
Dwyer, James Edward, <sup>1</sup>	Sunderland,	Alpha Sigma Phi.
Eryasian, Harry Adrian, <sup>1</sup>	Chelsea,	North College.
Field, Richard Edmund,	Shelburne Falls,	Q. T. V.
Freeman, Stanley Leonard,	Needham,	Mathematics Building.

<sup>1</sup> Work incomplete.

Gilbert, Frank Albert, Jr.,	Brandon, Vt.,	Lambda Chi Alpha.
Gowdy, Carlyle Hale,	Westfield,	103 Pleasant Street.
Haskins, Philip Hall, <sup>1</sup>	North Amherst,	North Amherst.
Higgin, Albert Snyder,	Passaic, N. J.,	Alpha Sigma Phi.
Hodgson, Robert Moore,	Newport, R. I.,	30 North Prospect Street.
Holmfan, Reginald Newton,	Somerville,	Q. T. V.
Hooper, Francis Edwards,	Revere,	Sigma Phi Epsilon.
Hurder, Ruth Wasson, <sup>1</sup>	Milton,	Adams House.
Hussey, Francis William, <sup>1</sup>	Whitinsville,	3 North College.
Jackson, Belding Francis,	Belchertown,	Belchertown.
Kemp, George Austin,	North Andover,	Lambda Chi Alpha.
Knapp, Irving Robinson, <sup>1</sup>	Scekonk,	3 North College.
Kokoski, Frank Joseph,	Amherst,	Amherst, R. F. D. 3.
Kraker, Abraham, <sup>1</sup>	Revere,	14 South College.
Kroeck, Julius, Jr.,	Huntington, L. I., N. Y.,	Phi Sigma Kappa.
Lacroix, Donald Sewall, <sup>1</sup>	Rowley,	Alpha Gamma Rho.
Law, Hervey Fuller,	Longmeadow,	Care of Mr. C. W. Eversen.
Lawrence, Robert Parker,	East Greenwich, R. I.,	11 North College.
Leland, James Freeman, Jr., <sup>1</sup>	Sherborn,	Alpha Sigma Phi.
Leonard, Earle Stanley, <sup>1</sup>	Hyde Park,	Lambda Chi Alpha.
Lewandowski, John Neptumcen, <sup>1</sup>	Easthampton,	Alpha Sigma Phi.
Lindquist, Harry Gotfred,	Holden,	7 North College.
Lockhart, John Harold, <sup>1</sup>	Tarrytown, N. Y.,	Theta Chi.
Lovering, Everett Waldron,	Northampton,	283 Prospect Street, North- ampton.
Lovering, Rolland Frederick, <sup>1</sup>	Northampton,	283 Prospect Street, North- ampton.
Lowery, John Gordon,	Malden,	Kappa Sigma.
Lyons, Edgar Albion,	Methuen,	7 North College.
Lyons, John Joseph, Jr., <sup>1</sup>	Arlington,	Sigma Phi Epsilon.
MacArdle, Herbert Aloysius,	Worcester,	Kappa Gamma Phi.
Main, Stuart DeGroff,	Maplewood, N. J.,	101 Butterfield Terrace.
Martin, Edward William,	Amherst,	5 Phillips Street.
McGuinn, Albert Francis,	Worcester,	83 Pleasant Street.
Moody, Kenneth Watts,	Brookline,	Lambda Chi Alpha.
Moseley, Henry Samson, <sup>1</sup>	Glastonbury, Conn.,	Alpha Sigma Phi.
Murdock, Matthew John,	Medford,	Q. T. V.
Murray, Harry Athol, Jr.,	Arlington,	West Experiment Station.
Murray, Myron George,	Davenport, Iowa,	Lambda Chi Alpha.
Nigro, Henry,	Revere,	15 North College.
Packer, George Blanchard, <sup>1</sup>	Waterbury, Conn.,	Sigma Phi Epsilon.
Peck, William Henry,	Stow,	11 North College.
Perry, Helen Margaret, <sup>1</sup>	Waltham,	Adams House.
Pickup, Ezra Alden, <sup>1</sup>	Holyoke,	6 North College.
Pollard, Jane Isabel, <sup>1</sup>	North Adams,	Adams House.
Randall, Kenneth Charles,	Springfield,	East Experiment Station.
Reed, Paul Malcolm, <sup>1</sup>	Baldwinville, <sup>1</sup>	Phi Sigma Kappa.
Richardson, Marjory, <sup>1</sup>	Millis,	Adams House.
Rollins, Walter Jessie, <sup>1</sup>	Westminster, Vt.,	Sigma Phi Epsilon.
Roser, Conrad Herman, <sup>1</sup>	Glastonbury, Conn.,	Phi Sigma Kappa.
Russell, Ralph,	Worcester,	2 North College.
Sherman, Kenneth David, <sup>1</sup>	Orange,	2 North College.
Smith, Albert William,	Easthampton,	15 South College.
Smith, Donald Hiram, <sup>1</sup>	Pittsfield,	Sigma Phi Epsilon.
Smith, Maxfield Merriam, <sup>1</sup>	Pittsfield,	Phi Sigma Kappa.
Smith, Rowland Piper, <sup>1</sup>	North Amherst,	46 Pleasant Street.
Spring, Hobart Wadsworth, <sup>1</sup>	Braintree,	Q. T. V.
Sullivan, Joseph Timothy, <sup>1</sup>	Lawrence,	Alpha Gamma Rho.
Swift, Arthur Lawrence, <sup>1</sup>	North Amherst,	Summer Street, North Am- herst.
Talmage, Harry John, <sup>1</sup>	Springfield,	Commons Club.
Tanner, Willis, <sup>1</sup>	Worcester,	Commons Club.
Thompson, George Henry, Jr.,	Lenox,	Sigma Phi Epsilon.

<sup>1</sup> Work incomplete.



Tucker, Francis Sample, <sup>1</sup>	Arlington,	Alpha Sigma Phi.
Vinton, Charles Raymond, <sup>1</sup>	Roxbury,	Theta Chi.
Walker, Philip Duane,	Hardwick,	Alpha Sigma Phi.
Walsh, John Leonard, <sup>1</sup>	Amherst,	35 East Pleasant Street.
Warren, Edwin Horbert,	Chelmsford,	Lambda Chi Alpha.
Waugh, Frederick Vail,	Amherst,	Kappa Sigma.
Weber, Harold Richard, <sup>1</sup>	Brooklyn, N. Y.,	4 Chestnut Street.
Wentsch, Harold Earle,	Southbury, Conn.,	Kappa Gamma Phi.
Whitaker, Carl Fates, <sup>1</sup>	Hadley,	Kappa Sigma.
White, George Edwin,	Worcester,	Kappa Gamma Phi.

## CLASS OF 1923 (SOPHOMORES).

Abele, Trescott Tupper,	Quincy,	16 North College.
Alexander, Donald Briggs, <sup>1</sup>	Boston,	29 North Prospect Street.
Alger, Mason Williams,	West Bridgewater,	Alpha Gamma Rho.
Ames, Nathaniel Jackson, <sup>1</sup>	Peabody,	Kappa Sigma.
Arrington, Luther Bailey,	Florence,	Alpha Gamma Rho.
Baker, Howard,	Marshfield,	Sigma Phi Epsilon.
Bartlett, Warren Leslie, <sup>1</sup>	Roslindale,	Phi Sigma Kappa.
Bateman, Eleanor Willard,	Arlington Heights,	Adams House.
Bates, Howard,	Beechwood,	Kappa Gamma Phi.
Bates, Robert Brooks,	West Springfield,	Alpha Gamma Rho.
Beal, James Allen,	Abington,	Kappa Sigma.
Bennett, James Stanley,	South Meriden, Conn.,	Alpha Gamma Rho.
Boles, Inza Almerna,	Dorchester,	Adams House.
Borgeson, Melvin Benjamin, <sup>1</sup>	Worcester,	Kappa Gamma Phi.
Brewer, Gardner Hunter,	Upton,	Commons Club.
Broderick, Lawrence Francis,	Hyde Park,	Commons Club.
Buckley, Francis Edward, <sup>1</sup>	Natick,	Kappa Sigma.
Buell, Robert Allyn, <sup>1</sup>	Orange,	53 Lincoln Avenue.
Burbeck, Joseph Howard, <sup>1, 2</sup>	Peabody,	Sigma Phi Epsilon.
Burke, Edmund William, <sup>1</sup>	Watertown,	Commons Club.
Cohen, Solomon, <sup>1</sup>	Dorchester,	8 North College.
Corash, Paul,	Worcester,	14 South College.
Davis, Frank Langdon,	Lexington,	Phi Sigma Kappa.
Dickinson, Lewis Everett, Jr.,	Holyoke,	Cottage Street.
Dowden, Philip Berry,	Sandwich,	Sigma Phi Epsilon.
Eldredge, Renel West,	Winchester,	Kappa Sigma.
Faneuf, John Benedict,	West Warren,	Commons Club.
Fitzpatrick, Leo Joseph, <sup>1</sup>	Brockton,	Commons Club.
Folsom, Owen Eugene,	Roslindale,	Phi Sigma Kappa.
Friend, Roger Boynton,	Dorchester,	Alpha Gamma Rho.
Fuller, Robert Donald,	Woburn,	Q. T. V.
Gamzue, Benjamin,	Holyoke,	8 North College.
Gay, Alfred Fullick,	Groton,	Theta Chi.
Gerry, Bertram Irving, <sup>1, 2</sup>	Peabody,	Alpha Gamma Rho.
Gildemeister, Mary Katherine, <sup>1</sup>	Belchertown,	Adams House.
Gold, Philip, <sup>1</sup>	Roxbury,	56 Pleasant Street.
Goldstein, Joseph, <sup>1, 2</sup>	Lynn,	14 South College.
Gordon, Howard Reynolds, <sup>1</sup>	Ipswich,	Lambda Chi Alpha.
Grayson, Raymond Henry, <sup>1</sup>	Milford,	Alpha Sigma Phi.
Hale, John Stanciff,	South Glastonbury, Conn.,	Phi Sigma Kappa.
Hallett, Melvin Bernard, <sup>1</sup>	Rockland,	East Experiment Station.
Hardy, Sherman Keeler, <sup>1</sup>	Littleton,	The Davenport.
Harrington, Robert John, <sup>1</sup>	Holyoke,	Alpha Sigma Phi.
Heath, Allan Jay, <sup>1</sup>	Newfane, Vt.,	13 North College.
Hilyard, Norman Douglas, <sup>1</sup>	Beverly,	Q. T. V.
Hodsdon, Marshall Sinclair,	Melrose Highlands,	12 South College.
Holley, George Gilbert, <sup>2</sup>	Fiskdale,	Lambda Chi Alpha.
Hollis, Frederick Allen,	Charlton,	1 North College.
Hosmer, Frank Howard, <sup>1</sup>	Greenfield,	Theta Chi.

<sup>1</sup> Work incomplete.<sup>2</sup> Admitted on service record. Entrance record not complete.

Hunter, Henry Leander, Jr., <sup>1</sup>	Mount Kisco, N. Y.,	Theta Chi.
Irish, Gilbert Henry,	Turner, Me.,	Lambda Chi Alpha.
Johnson, Cleon Bancroft, <sup>1</sup>	Ipswich,	6 Nutting Avenue.
Johnson, Eyrle Gray, <sup>1</sup>	Mattapan,	Lambda Chi Alpha.
Jones, Alan, <sup>1</sup>	Boston,	1 North College.
Keith, Clifford Woodworth, <sup>1</sup>	Providence, R. I.,	Mount Pleasant.
Labrovitz, Rose Florence,	Amherst,	11 Amity Street.
Latour, Oliver Page, <sup>1</sup>	Worcester,	Kappa Gamma Phi.
Lewis, Molly LeBaron,	Jamaica Plain,	Adams House.
Lindskog, Gustaf Elmer Richard,	Roxbury,	Clark Hall.
Luddington, Frank Dennison, <sup>1</sup>	Hamden, Conn.,	23 East Pleasant Street.
MacCready, Donald Eugene, <sup>1</sup>	Elizabeth, N. J.,	12 South College.
Marshall, Alexander Borea, <sup>1</sup>	Manhasset, L. I., N. Y.,	6 Nutting Avenue.
Marshman, Wilbur Horace, <sup>1</sup>	Springfield,	Kappa Sigma.
Martin, Frances Barbara,	Amherst,	5 Phillips Street.
Martin, Robert Fitz-Randolph,	Amherst,	Amherst House.
Mather, Edna,	Amherst,	5 Allen Street.
Mohor, Robert deSales, <sup>1</sup>	Newton Center,	Phi Sigma Kappa.
Mudgett, Vernon Downer, <sup>1</sup>	Brookline,	16 South College.
Newell, Richard Carl,	West Springfield,	Alpha Gamma Rho.
Norcross, Harry Cecil, <sup>1</sup>	Brimfield,	20 South College.
Nowers, Donald Gilford, <sup>1, 2</sup>	Danvers,	Care of Mr. F. C. Pray, North Amherst.
Paddock, Wallace Earl,	Worcester,	Lambda Chi Alpha.
Perry, Chauncey Valentine, <sup>1</sup>	Waltham,	Poultry Administration Building.
Picard, Charles Francis, <sup>1</sup>	Plymouth,	Commons Club.
Putnam, Ernest Taylor, <sup>1, 2</sup>	Greenfield,	North Amherst.
Ribero, Edwin Francis, <sup>1</sup>	Franklin,	Alpha Sigma Phi.
Richards, Homer Flint, <sup>1</sup>	Reading,	7 Phillips Street.
Richardson, Mark Morton, <sup>1</sup>	West Brookfield,	11 South College.
Roberts, Arthur William,	Hyde Park,	Theta Chi.
Russell, Charles Francis, <sup>1</sup>	Winchendon,	1 Allen Street.
Sandow, Alexander, <sup>3</sup>	Pittsfield,	23 East Pleasant Street.
Sargent, Richmond Holmes,	Buxton, Me.,	103 Pleasant Street.
Sears, Fred Grant, Jr.,	Dalton,	120 Pleasant Street.
Sharpe, Charles Gertner, <sup>1</sup>	Blandford,	15 Spring Street.
Shea, Thomas Francis, <sup>1</sup>	Holyoke,	Kappa Gamma Phi.
Slade, Irving Woodman,	Chelsea,	Kappa Sigma.
Smith, Jeffrey Poole,	West Roxbury,	9 North College.
Snow, Thomas Lathrop,	Greenfield,	Alpha Gamma Rho.
Tanner, Edwin, <sup>1</sup>	Worcester,	Commons Club.
Tarplin, Allan Sebastian, <sup>1</sup>	Brookline,	Entomology Building.
Tarr, James Gordon, <sup>1</sup>	Everett,	29 North Prospect Street.
Task, Mortimer, <sup>1</sup>	West Stoughton,	12 North College.
Tileston, Roger Gordon, <sup>1</sup>	Sharon,	3 Nutting Avenue.
Tisdale, Edward Norman, <sup>1</sup>	Medfield,	Lambda Chi Alpha.
Towne, Carroll Alden,	Auburndale,	Q. T. V.
Towne, Warren Hannaford,	Cambridge,	13 North College.
Tumey, Malcomb Edward, <sup>1</sup>	Greenfield,	Q. T. V.
Turner, Dorothy Van Hoven,	Amherst,	Adams House.
Wendell, Richard Goodwin,	Belmont,	120 Pleasant Street.
Whitaker, Holden,	Newton Highlands,	Q. T. V.
Whittier, John McKey, <sup>1</sup>	Everett,	Kappa Sigma.
Williams, Forrest Earl,	Sunderland,	Q. T. V.
Wirth, Conrad Louis, <sup>1</sup>	Minneapolis, Minn.,	Kappa Sigma.
Woodworth, Leverett Stearns,	Nowton,	Care of R. C. Adams, North Amherst.

<sup>1</sup> Work incomplete.<sup>2</sup> Admitted on service record. Entrance record not complete.<sup>3</sup> Admitted on scholarship probation. Entrance record not complete.

## CLASS OF 1924 (FRESHMEN).

Argy, Warren George, <sup>1</sup>	Turners Falls, . . .	5 Farview Way.
Armstrong, Bradford, . .	Konsington, Md., . .	3 Allen Street.
Arrangelovich, Danitza, <sup>2</sup>	Bolgrad, Serbia, . .	Adams House.
Atkins, Harold Kont, <sup>1</sup>	Weehawken, N. J., . .	73 Pleasant Street.
Ball, Kenneth Moore, . .	Bloomfield, N. J., . .	Care of R. C. Adams, North Amherst.
Barker, John Stuart, . .	West Bridgewater, . .	17 Fearing Street.
Barrows, Robert Arthur, <sup>1</sup>	Quincy, . . .	7 Nutting Avenue.
Bartaux, Frank Everett, .	Framingham, . . .	53 Lincoln Avenue.
Bartlett, Frederick Sheldon, .	Westfield, . . .	31 East Pleasant Street.
Bartlett, Perry Goodell, .	Holyoke, . . .	6 North College.
Belden, Clifford Luce, . .	Bradstreet, . . .	15 Fearing Street.
Biko, Edward Louis, . .	Westfield, . . .	31 East Pleasant Street.
Bilske, Francis Paul, . .	Hadley, . . .	Hadley.
Blanchard, Norman Harris, <sup>1</sup>	Pittsfield, . . .	7 Nutting Avenue.
Bliss, Elisha French, Jr., .	Springfield, . . .	17 Fearing Street.
Bowers, Frank Henry, Jr., <sup>1</sup>	Mansfield, . . .	17 Fearing Street.
Bowes, Charles Atwell, . .	Worcester, . . .	McClure Street.
Bowes, Curtis Glover, . .	Swampscott, . . .	83 Pleasant Street.
Brickett, Paul Eastman, <sup>1</sup>	West Lynn, . . .	41 East Pleasant Street.
Brunner, Fred, Jr., . . .	New York, N. Y., . .	6 Nutting Avenue.
Cahalane, Victor Harrison, .	Charlestown, N. H., .	116 Pleasant Street.
Carpenter, Earle Stanton, .	Rehoboth, . . .	116 Pleasant Street.
Chase, Theodore Martin, . .	Milton, . . .	Mount Pleasant.
Clark, Charles O'Reilly, . .	Beachmont, . . .	101 Pleasant Street.
Collins, Oscar Ernest, . .	Fitchburg, . . .	7 Phillips Street.
Cromack, Earl Augustus, <sup>1</sup>	Shelburne, . . .	15 Fearing Street.
Cummings, Leslie Samuel, .	Webster, . . .	120 Pleasant Street.
Darling, Robert Martin, . .	Cambridge, . . .	66 Pleasant Street.
Davis, Howard Halsey, . .	Brockton, . . .	17 Fearing Street.
Davis, Stanley Whitcomb, .	Rockland, . . .	7 Phillips Street.
Deuel, Charles Frederick, 2d, <sup>1</sup>	Amherst, . . .	30 Lincoln Avenue.
Dresser, Allen Lucius, . .	Leominster, . . .	66 Pleasant Street.
DuBois, Martin Lee, . . .	New Paltz, N. Y., . .	44 Triangle Street.
Eaton, William Henry, . .	Wilbraham, . . .	30 North Prospect Street.
Elliott, James Alexander, <sup>2</sup>	Summit, N. J., . . .	Care of Mr. George Cooley, Sunderland.
Emery, George Edward, . .	Marlborough, . . .	31 East Pleasant Street.
Epps, Martha Belle Scott, .	Wilbraham, . . .	Adams House.
Fenton, John Michael, <sup>2</sup>	Amherst, . . .	108 Pleasant Street.
Fernald, Leland Hoyt, <sup>1</sup>	Concord, . . .	10 North College.
Ferranti, Edmund Tony, . .	West Bridgewater, . .	17 Fearing Street.
Flint, Ruth Guild, . . .	Boston, . . .	Adams House.
Frost, Sherman Clark, <sup>1</sup>	West Somerville, . .	3 Nutting Avenue.
Frost, Willard Chamberlain, .	Milford, . . .	21 Fearing Street.
Garretson, Alfred Corwin, .	Bound Brook, N. J., .	Care of Mr. M. W. Hoyt.
Geiger, Aimee Suzanne, <sup>1</sup>	Pepperell, . . .	Adams House.
Gifford, Richard Smith, . .	South Westport, . .	7 Nutting Avenue.
Goldsmith, Eliot Gray, . .	Brookline, . . .	32 North Prospect Street.
Grieve, Alexander Watson, .	Dorchester, . . .	4 North College.
Gryzwacz, Patrick Louis, . .	Ware, . . .	101 Pleasant Street.
Hairston, Joseph Jester, <sup>1</sup>	Homestead, Pa., . .	10 Boston Street.
Haskell, Malcolm Rawson, . .	Amherst, . . .	27 Main Street.
Hayden, Luther Leonard, Jr., .	Brookville, . . .	13 Phillips Street.
Hayes, William Bointon, . .	South Deerfield, . .	73 Pleasant Street.
Hill, Carroll Victor, <sup>1</sup>	Worcester, . . .	9 Phillips Street.
Holteen, John Gunnar, . .	Quincy, . . .	15 Hallock Street.
Holway, Clarence Waren, <sup>1</sup>	Holden, . . .	4 Chestnut Street.

<sup>1</sup> Work incomplete.<sup>2</sup> Admitted on scholarship probation. Entrance record not complete.

Hopkins, David, . . . .	Medford, . . . .	42 McClellan Street.
Hubbard, Doris, <sup>1</sup> . . . .	Newton, . . . .	Adams House.
Humphrey, Laurence Edmund, <sup>1</sup> . . . .	Wareham, . . . .	27 Fearing Street.
Hutchins, Osburne Amos, <sup>1</sup> . . . .	Shelburne, . . . .	10 Nutting Avenue.
Isaac, Carl Frederick, . . . .	Brighton, . . . .	35 East Pleasant Street.
Kane, Edward Anthony, <sup>1</sup> . . . .	Westfield, . . . .	17 Phillips Street.
Kennedy, Lowell Francis, . . . .	Cambridge, . . . .	18 Nutting Avenue.
Kilbourn, James Sheldon, <sup>1</sup> . . . .	Cambridge, . . . .	Care of Mrs. Russell, Cottage Street.
King, Rosewell Howard, <sup>1</sup> . . . .	Millville, . . . .	23 East Pleasant Street.
Lal, Prem Chand, <sup>2</sup> . . . .	India, . . . .	North College.
Lamb, Eric Franklin, <sup>1</sup> . . . .	Waban, . . . .	81 Pleasant Street.
Lane, Wilfred Craig, . . . .	Fitchburg, . . . .	7 Phillips Street.
Leathe, William Wallace, <sup>1</sup> . . . .	Larchmont, N. Y., . . . .	35 East Pleasant Street.
Loland, Allen Sanford, . . . .	East Bridgewater, . . . .	6 Nutting Avenue.
Loring, Kenneth Stockwell, . . . .	Melrose Highlands, . . . .	1 Allen Street.
Lyons, Mildred Harris, <sup>1</sup> . . . .	Holyoke, . . . .	Adams House.
MacAfee, Norman Hear, . . . .	Cambridge, . . . .	41 East Pleasant Street.
Macaulay, Donald Francis, <sup>1</sup> . . . .	Beverly, . . . .	42 McClellan Street.
Mader, Russell Curtis, . . . .	Waltham, . . . .	2 McClellan Street.
Manchester, Philip, . . . .	Fall River, . . . .	18 Nutting Avenue.
McElroy, James Ernest, <sup>1</sup> . . . .	Orange, . . . .	6 Nutting Avenue.
Merrick, Charles Llewellyn, . . . .	Wilbraham, . . . .	30 North Prospect Street.
Merrick, Stuart Halliwell, . . . .	Wilbraham, . . . .	30 North Prospect Street.
Miller, Warwick Baise, <sup>1</sup> . . . .	Providence, R. I., . . . .	53 Lincoln Avenue.
Morris, Walter Markley, <sup>1</sup> . . . .	Amherst, . . . .	8 Nutting Avenue.
Morse, Alfred Bullard, <sup>1</sup> . . . .	Oakham, . . . .	4 Chestnut Street.
Morse, Howard Babbidge, <sup>1</sup> . . . .	Townsend, . . . .	30 North Prospect Street.
Myriek, Sterling, . . . .	Longmeadow, . . . .	84 Pleasant Street.
Nelson, Carl Olaf, . . . .	Gloucester, . . . .	13 Phillips Street.
Nicoll, Arthur Chester, <sup>1</sup> . . . .	Quincy, . . . .	7 Nutting Avenue.
Noyes, Russell, . . . .	Newtonville, . . . .	25 North Prospect Street.
Nutting, Raymond Edwin, . . . .	Fitchburg, . . . .	7 Phillips Street.
Oklobdzia, Boris, <sup>2</sup> . . . .	Bosnia, Serbia, . . . .	51 Amity Street.
Palmer, Harold Conwell, <sup>1</sup> . . . .	Amherst, . . . .	13 South Prospect Street.
Pearson, John Cleary, <sup>1</sup> . . . .	Cambridge, . . . .	116 Pleasant Street.
Percival, Gordon Pittinger, . . . .	Medfield, . . . .	18 Nutting Avenue.
Poe, Frederick, <sup>2</sup> . . . .	Havana, Cuba, . . . .	42 McClellan Street.
Porges, Nandor, . . . .	Hyde Park, . . . .	56 Pleasant Street.
Pratt, Wallace Francis, . . . .	Rockland, . . . .	17 Fearing Street.
Read, John Gammons, . . . .	Springfield, . . . .	73 Pleasant Street.
Reynolds, Joseph Sagar, <sup>1</sup> . . . .	Attleboro, . . . .	14 North College.
Rhodes, Winthrop Gordon, . . . .	Waban, . . . .	25 North Prospect Street.
Ricker, Chester Sewall, <sup>1</sup> . . . .	Worcester, . . . .	120 Pleasant Street.
Roeder, Frank Richason, . . . .	Turners Falls, . . . .	6 Nutting Avenue.
Root, Frank Edson, . . . .	Barnardston, . . . .	83 Pleasant Street.
Rowell, Elwyn Joseph, . . . .	Amherst, . . . .	44 Triangle Street.
Salman, Konneth Allen, . . . .	Needham, . . . .	11 North College.
Schaffer, Carlton Hill, <sup>1</sup> . . . .	Ashfield, . . . .	17 Phillips Street.
Sellers, Wendell Folsom, <sup>1</sup> . . . .	Melrose, . . . .	9 Phillips Street.
Shepard, Harold Henry, <sup>2</sup> . . . .	South Royalston, . . . .	8 Kellogg Avenue.
Sherman, Willis Whitney, <sup>1</sup> . . . .	Dorchester, . . . .	Care of Mr. H. N. Worthley, Mount Pleasant.
Sime, Arnold Jay, <sup>1</sup> . . . .	Adams, . . . .	29 North Prospect Street.
Sims, Konneth Wallaco, . . . .	South Boston, . . . .	3 Allen Street.
Slack, Marion Florence, . . . .	Brookline, . . . .	Adams House.
Smith, Richard Burr, . . . .	Greenfield, . . . .	Phi Sigma Kappa.
Smith, Vera Irene, . . . .	Amhorst, . . . .	Adams House.
Staebner, Alfred Porter, <sup>1</sup> . . . .	Willimantic, Conn., . . . .	46 Triangle Street.
Stocle, Charles Wasser, . . . .	Marblehead, . . . .	10 North College.
Steere, Robert Ernest, . . . .	Chepachet, R. I., . . . .	116 Pleasant Street.

<sup>1</sup> Work incomplete.<sup>2</sup> Admitted on scholarship probation. Entrance record not complete.

Storling, Ann, <sup>1</sup>	Lancaster,	Adams House.
Stevenson, Harold Dudley,	Camden, Mo.,	8 Nutting Avenue.
Stone, George Leroy,	Montello,	120 Pleasant Street.
Tewhill, Charles James,	Florence,	6 Nutting Avenue.
Thompson, Alice Elizabeth,	Amherst,	Mount Pleasant.
Thornton, Clarence Percy, <sup>1</sup>	Pelham,	Pelham.
Tobey, Charles Sylvester,	Bolmont,	7 Nutting Avenue.
Turner, Dana Burwell, <sup>1</sup>	Chester,	53 Lincoln Avenue.
Varnum, Thomas, Jr., <sup>1</sup>	Lowell,	66 Pleasant Street.
Waugh, Albert Edmund,	Amherst,	M. A. C.
Weatherwax, Howard Erle, <sup>1</sup>	Greenfield,	116 Pleasant Street.
White, Samuel Henry,	Orange,	10 North College.
Whitman, Chester Edgerly, <sup>1</sup>	Suffield, Conn.,	4 Chestnut Street.
Whitney, Will Alvah,	Taunton,	4 North College.
Wilhelm, George Henry,	Holyoke,	4 Chestnut Street.
Williams, James Lowell,	Sunderland,	6 Nutting Avenue.
Witt, Earl Maynard,	Belchertown,	Belchertown.
Wood, Ruth Millicent, <sup>1</sup>	North Andover,	Adams House.
Wood, William Wilson,	Barre Plains,	23 East Pleasant Street.
Woodworth, Robert Hugo, <sup>1</sup>	Newton,	Care of R. C. Adams, North Amherst.

## UNCLASSIFIED STUDENTS.

Collins, John Lucie,	Wakefield,	The Perry.
Gahan, Laurence Keith,	Worcester,	4 Chestnut Street.
Goodale, Geoffrey Dearborn,	Boston,	8 Nutting Avenue.
Gustin, Francis Borden,	North Amherst,	North Amherst.
Hemenway, Rachel Viola,	Williamsburg,	Adams House.
Richardson, Lester Thornley,	Waltham,	44 Pleasant Street.
Stevens, Richard Clinton,	Winchester,	9 Fearing Street.
Stockbridge, John Sylvester,	Atlanta, Ga.,	Kappa Sigma.
Tattam, Francis David,	Cambridge,	Stockbridge Hall.
Wendler, Henry George,	Clinton,	Stockbridge Hall.

*Registered after the Catalogue for 1919 was published.*

Bagdasarian, Albert Charles,	Cambridge.
Hagen, Sophus,	Maplewood.
Kimball, William Howard,	Rehoboth.
Martinovich, Petar,	Serbia.
Rawding, Stanley Robert,	—
Searls, Edward Marlborough,	Schaghticoke, N. Y.

## SPECIAL STUDENTS.

Anderson, Verner Sixten,	South Manchester, Conn.,	35 North Prospect Street.
Delaney, Rose Margaret,	Holyoke,	79 Pleasant Street.
Downs, Myron Herbert,	South Jamesport, L. I.,	83 Pleasant Street.
	N. Y.	
Egner, Henry Andrew,	Walpole,	17 Pleasant Street.
Kimball, Harold Lincoln,	Waltham,	120 Pleasant Street.
Love, Donald Burt,	Lexington,	120 Pleasant Street.
Merwin, John Demarest,	Southold, L. I., N. Y.,	83 Pleasant Street.
Morrison, Daniel Kenneth,	Newport, R. I.,	120 Pleasant Street.
Regan, Leon Ashley,	Walpole,	18 Nutting Avenue.
Spencer, Miriam Isabelle,	Springfield,	Draper Hall.
Thormond, Felix Crafton,	Houston, Tex.,	101 Pleasant Street.
Wells, Marcus Belden,	North Adams,	120 Pleasant Street.
Wiklund, Carl John,	Norfolk,	17 Pleasant Street.

<sup>1</sup> Work incomplete.

## GEOGRAPHICAL SUMMARY.

Massachusetts, . . . . .	428
Connecticut, . . . . .	13
New York, . . . . .	14
New Jersey, . . . . .	9
Rhode Island, . . . . .	7
Maine, . . . . .	4
Pennsylvania, . . . . .	4
Vermont, . . . . .	4
Georgia, . . . . .	2
Alabama, . . . . .	1
Idaho, . . . . .	1
Indiana, . . . . .	1
Iowa, . . . . .	1
Maryland, . . . . .	1
Minnesota, . . . . .	1
New Hampshire, . . . . .	1
South Dakota, . . . . .	1
Texas, . . . . .	1
Virginia, . . . . .	1
West Virginia, . . . . .	1
Canada, . . . . .	4
Cuba, . . . . .	1
India, . . . . .	2
Japan, . . . . .	1
Serbia, . . . . .	2
Total, . . . . .	506

## SUMMARY BY CLASSES.

CLASS.	Men.	Women.	Total.
Graduate school, . . . . .	41	7	48
Senior class, 1921, . . . . .	94	3	97
Junior class, 1922, . . . . .	94	5	99
Sophomore class, 1923, . . . . .	96	8	104
Freshman class, 1924, . . . . .	124	11	135
Unclassified students, . . . . .	9	1	10
Special students, . . . . .	11	2	13
Totals, . . . . .	469	37	506

## SHORT COURSE ENROLLMENT.

### TWO-YEAR COURSE IN AGRICULTURE — GRADUATES, 1920.

Bartlett, John Hussey, Jr.,	.	.	.	.	.	.	Nantucket.
Burrington, Reginald Clifton,	.	.	.	.	.	.	North Amherst.
Clapp, Horace Damon,	.	.	.	.	.	.	Easthampton.
Clark, Elbridge Theodore,	.	.	.	.	.	.	Millis.
Davis, Frederick Oscar,	.	.	.	.	.	.	Windsor, Vt.
Frary, Frank Taylor,	.	.	.	.	.	.	Southampton.
Hall, Robert Hancock,	.	.	.	.	.	.	Waverley.
Hawes, Leon Roy,	.	.	.	.	.	.	Sudbury.
Kirchner, Robert Walter,	.	.	.	.	.	.	Pittsfield.
Parsons, Phillips Henry,	.	.	.	.	.	.	Southampton.
Reid, Howard Stanton,	.	.	.	.	.	.	Franklin.
Segelman, Max,	.	.	.	.	.	.	Chelsea.
VanDerpoel, Ernest Collins,	.	.	.	.	.	.	Chicopee Falls.
Wickwire, Harry Wyndom,	.	.	.	.	.	.	Worcester.

### RURAL ENGINEERING COURSE — GRADUATES, 1920.

Burt, John Holton,	.	.	.	.	.	.	Hyde Park.
French, Percy Jackson,	.	.	.	.	.	.	Rockland.
Jarvis, Albert Arthur,	.	.	.	.	.	.	East Boston.
Mirault, Joseph Dustin,	.	.	.	.	.	.	Holyoke.
Nelson, Guy Leslie,	.	.	.	.	.	.	Milford, N. H.
Whitbeck, Henry,	.	.	.	.	.	.	Alandar.

### VOCATIONAL POULTRY COURSE — GRADUATES, 1920.

Abererombie, Edward Marion,	.	.	.	.	.	.	Greenfield.
Goodnow, Lewis Weston,	.	.	.	.	.	.	Greenfield.
Hatch, Henry Donald,	.	.	.	.	.	.	Auburn, Me.

### TWO-YEAR COURSE, 1920-21.

#### *Second Year.*

Allen, Chester Carolton,	.	.	North Amherst,	.	.	North Amherst, Box 103.
Almy, Roger Warren,	.	.	New Bedford,	.	.	29 Lincoln Avenue.
Amsden, Maude Ella,	.	.	Petersham,	.	.	Adams House.
Baird, Francis William,	.	.	Somerville,	.	.	44 Pleasant Street.
Barney, Ernest Wellman,	.	.	Corinna, Me.,	.	.	32 Amity Street.
Baxter, Samuel Ballantine,	.	.	Tenafly, N. J.,	.	.	75 Pleasant Street.
Bemis, Raymond Battles,	.	.	Spencer,	.	.	North Amherst.
Bennett, William Whytal,	.	.	Arlington,	.	.	101 Pleasant Street.
Boland, Albert Moore,	.	.	Worcester,	.	.	108 Pleasant Street.
Breen, Arthur Joseph,	.	.	Granby,	.	.	27 Fearing Street.
Bronsdon, William Abbott,	.	.	Baldwinsville,	.	.	75 Pleasant Street.
Brooker, John Patrick,	.	.	Roxbury,	.	.	35 North Prospect Street.
Bruce, Mary Elizabeth,	.	.	Boston,	.	.	Adams House.
Bryant, Frank Kenneth,	.	.	Lowell,	.	.	8 Kellogg Avenue.
Burke, Leslie Joseph,	.	.	Medford,	.	.	75 Pleasant Street.
Burnett, Marston,	.	.	Lexington,	.	.	12 Nutting Avenue.
Burnham, Theodore Shelly,	.	.	Essex,	.	.	70 Lincoln Avenue.

Cady, Howard Meader, . . .	South Shaftsbury, Vt., . . .	13 South Prospect Street.
Camp, Emily Blackstone, . . .	Norwich, Conn., . . .	The Davenport.
Carpenter, Ruth, . . .	Hudson, . . .	Adams House.
Carroll, Margaret Adelaide, . . .	Boston, . . .	Adams House.
Christensen, Frank William, . . .	North Easton, . . .	13 Phillips Street.
Clark, Chester Frederic, . . .	Fitchburg, . . .	North Amherst.
Coles, Howard Finlay, . . .	Tarrytown, N. Y., . . .	86 Pleasant Street.
Colton, Hartman Dudley, . . .	Springfield, . . .	116 Pleasant Street.
Converse, John Kendrick, . . .	Andover, . . .	108 Pleasant Street.
Corey, Raymond Stanley, . . .	Amherst, . . .	41 East Pleasant Street.
Crocker, Fred Carlton, . . .	Amherst, . . .	30 Cottage Street.
Crosby, Leon Royal, . . .	Tyngsborough, . . .	34 Pleasant Street.
Crowell, Homer Merrill, . . .	Nutley, N. J., . . .	Gray Street.
Daisy, Walter Edward, . . .	Roslindale, . . .	13 Amity Street.
Dill, Clarence Elmer, . . .	Raynham Center, . . .	31 Pleasant Street.
Deane, Robert Allen, . . .	North Brookfield, . . .	70 Lincoln Avenue.
Dole, Stevens Field, . . .	Shelburne, . . .	7 East Pleasant Street.
DuFresne, Francis Armand, . . .	Lenox, . . .	Hatch Experiment Station.
Dunbar, Charles Basil, . . .	Taunton, . . .	Ye Aggie Inn.
Dunleavy, Henry Jay, . . .	Boston, . . .	2 Tyler Place.
Estey, Roger Bradshaw, . . .	Somerville, . . .	75 Pleasant Street.
Gallant, Daniel Joseph, . . .	Gloucester, . . .	15 Phillips Street.
Gaudette, Claude Isreal, . . .	Boston, . . .	28 Pleasant Street.
Gifford, Franklin Maynard, . . .	Middleborough, . . .	North Amherst.
Girard, Albert John, . . .	East Brimfield, . . .	15 Hallock Street.
Graumann, Lewis Matthew, . . .	Roxbury, . . .	108 Pleasant Street.
Griffin, Artemas Gage, . . .	Westford, . . .	15 Hallock Street.
Hall, Helen, . . .	Milton, . . .	50 Pleasant Street.
Hamilton, Grant Ethan, . . .	Clarksburg, . . .	20 Lessey Street.
Hancock, Russell Hagen, . . .	Vineyard Haven, . . .	5 Nutting Avenue.
Hartling, Wilfred Lewis, . . .	Boston, . . .	16 Amity Street.
Hartwell, Robert Mantor, . . .	Buckland, . . .	116 Pleasant Street.
Haskell, Wilder Alexander, . . .	South Hadley Falls, . . .	15 Hallock Street.
Hayden, Arthur Leo, . . .	Natick, . . .	35 North Prospect Street.
Heinlein, Edward Bancroft, . . .	Dover, . . .	17 Pleasant Street.
Hoyt, Perley Luther, . . .	Perkinsville, Vt., . . .	20 Lessey Street.
Huckins, Norman Charles, . . .	Dorchester, . . .	34 Pleasant Street.
Huntley, Robert Ernest, . . .	West Somerville, . . .	73 Pleasant Street.
Igo, Bernard James, . . .	West Somerville, . . .	Eastman Lane, Box 476.
Jacquos, John William, . . .	Malden, . . .	43 East Pleasant Street.
Jauncey, Oakleigh Wells, . . .	Williamstown, . . .	3 McClellan Street.
Judge, Clarence Peter, . . .	Raynham, . . .	31 Pleasant Street.
Kallio, Tovio Matthew, . . .	Middlefield, . . .	3 North Prospect Street.
Kimball, Howard Augustus, . . .	Littleton, . . .	9 Fearing Street.
Knight, Henry Elbridge, . . .	Amherst, . . .	71 Main Street.
Laurence, Harold Tildon, . . .	Auburndale, . . .	22 North Prospect Street.
Lawton, Edgar Lewis, . . .	Brattleboro, Vt., . . .	70 Lincoln Avenue.
Libby, Ben Frank, . . .	Springfield, . . .	East Experiment Station.
Libby, Carl Estes, . . .	Springfield, . . .	East Experiment Station.
Lincoln, Leon Patterson, . . .	Barre, . . .	66 Pleasant Street.
Lord, George Walker, . . .	Framingham, . . .	51 Amity Street.
Lounsbury, Francis Edward, . . .	Cambridge, . . .	13 Phillips Street.
MacLeod, Norman Frederick, . . .	Lynn, . . .	108 Pleasant Street.
Macomber, Donald Arthur, . . .	Springfield, . . .	13 Amity Street.
Magoon, Austin William, . . .	Greensboro, Vt., . . .	103 Butterfield Terrace.
McFarlan, John Wesley, . . .	Cincinnati, Ohio, . . .	75 Pleasant Street.
Miler, Fred Reuben, . . .	Bernardston, . . .	North Amherst, Box 82.
Morse, Harold Sterling, . . .	Arlington, . . .	23 East Pleasant Street.
Morse, Herbert Edgar, . . .	Foxborough, . . .	18 Nutting Avenue.
Mullen, Frank Myles, . . .	Fayville, . . .	36 North Prospect Street.
Mumford, William Henry, . . .	Springfield, . . .	48 Pleasant Street.
Narkin, Isadora, . . .	Brockton, . . .	56 Pleasant Street.
Newell, Joseph Dolaplane, . . .	Brooklyn, N. Y., . . .	Pleasant Street, care of Mrs. H. D. Fearing.



Norrington, Henry, . . . .	Amherst, . . . .	25 Gray Street.
Nowers, Rodman Clark, . . .	Danvers, . . . .	17 Kellogg Avenue.
Oakes, John Joseph, . . . .	Wollesley, . . . .	35 North Prospect Street.
O'Brien, Katherine Frances, . .	Lawrence, . . . .	Adams House.
Olson, Niles Thodore, . . . .	Dorchester, . . . .	2 Tylor Place.
O'Neal, Fred, . . . .	Yakima, Wash., . . .	44 Pleasant Street.
Owens, Zorayda Kathleen, . . .	Haverhill, . . . .	Adams House.
Pagliaro, Frank Mary, . . . .	Springfield, . . . .	75 Pleasant Street.
Pollis, Abraham, . . . .	Chelsoa, . . . .	15 Phillips Street.
Pickard, Herbert Peirce, . . . .	Concord Junction, . . .	17 Kellogg Avonuo.
Priest, Atwood Wheeler, . . . .	North Vassalboro, Me.,	Mount Pleasant, care of C. R. Green.
Purdy, Donald Ring, . . . .	Waverley, . . . .	3 Eames Avonuo.
Quinn, William Robert, . . . .	Natick, . . . .	35 North Prospect Street.
Quirk, William Joseph, . . . .	Waltham, . . . .	101 Pleasant Street.
Raymond, Matthew George, . . .	Amherst, . . . .	Box 552.
Richards, Osgood Samuel, . . .	Amherst, . . . .	5 School Street.
Robinson, Frederick Charles, . .	Westford, . . . .	17 Pleasant Street.
Robinson, Leo Victor, . . . .	Amherst, . . . .	North Amherst, care of J. Dowd.
Rodwaye, George Wildemere, . .	Amherst, . . . .	9 Gaylord Street.
Root, Howard Chapin, . . . .	Colerain, . . . .	15 Hallock Street.
Russell, Paul Belford, . . . .	West Modway, . . . .	9 Fearing Street.
Sanctuary, Alfred Everett, . . .	Amherst, . . . .	196 South Pleasant Street.
Sawyer, John Henry, . . . .	North Brookfield, . . .	Mount Pleasant, care of H. N. Worthley.
Sexton, John Welch, . . . .	South Boston, . . . .	6 Nutting Avenue.
Shaw, Charles Dudley, . . . .	Westfield, . . . .	120 Pleasant Street.
Shaw, Walter Bruce, . . . .	Sutton, . . . .	8 Kellogg Avenue.
Smith, Raymond Leslie, . . . .	East Hartford, Conn.,	East Experiment Station.
Smith, Sidney Alexander, . . . .	Worcester, . . . .	79 Pleasant Street.
Snelling, Samuel William, . . .	Lincoln, . . . .	34 Pleasant Street.
Spinney, Joseph Warren, . . . .	Manchester, . . . .	East Experiment Station.
Spooner, Roy Adelbert, . . . .	Dorchester, . . . .	31 East Pleasant Street.
Spooner, William Danforth, . . .	Brimfield, . . . .	61 Amity Street.
Spring, Earle Nelson, . . . .	Millers Falls, . . . .	20 Lossey Street.
Steele, Gordon Ellis, . . . .	Waverley, . . . .	108 Pleasant Street.
Steele, Percy Howard, . . . .	Hopkinton, . . . .	101 Pleasant Street.
Talbot, William Joseph, . . . .	Amherst, . . . .	8 Hallock Street.
Taylor, Arthur Raymond, . . . .	Framingham, . . . .	East Experiment Station.
Thorn, Henry Holton, . . . .	Deerfield, . . . .	North Amherst.
Tipple, Albert Nelson, . . . .	Amherst, . . . .	15 Amity Street.
Trafton, Walter Richard, . . . .	Swampscott, . . . .	70 Lincoln Avenue.
Vartanian, Neshan, . . . .	Indian Orchard, . . . .	9 Fearing Street.
Veselak, Helen Clara, . . . .	Westfield, . . . .	Adams House.
Walsh, John, Jr., . . . .	Bedford, . . . .	North Pleasant Street, Box 523.
Warner, Harry Freeman, . . . .	Wollaston, . . . .	83 Pleasant Street.
Waterman, Harry Lester, . . . .	South Thomaston, Me.,	70 Lincoln Avenue.
Watson, Alan Wendell, . . . .	Providence, R. I., . . .	17 Kellogg Avenue.
Whitcomb, Harold Adams, . . . .	Concord Junction, . . .	Farview Way, care of J. K. Shaw.
White, Alice Louise, . . . .	Bristol, Conn., . . . .	Adams House.
White, Ralph Harold, . . . .	Barnard, Vt., . . . .	66 Pleasant Street.
Whitmore, Raymond Swett, . . .	Arlington Heights, . . .	3 Eames Avenue.
Wiggin, Herman Theron, . . . .	Norwood, . . . .	83 Pleasant Street.
Willson, Stewart Hemingway, . .	Thompsonville, Conn.,	75 Pleasant Street.
Wilson, Harvey William, . . . .	Boston, . . . .	Eastman Lane, Box 631.
Wood, Matthew Arnold, . . . .	South Portland, Me., . .	73 Pleasant Street.
Young, George Thomas, . . . .	Wilkinsonville, . . . .	8 Kellogg Avenue.

*First Year.*

Adair, Eldred, . . . . .	Boston, . . . . .	President's House, M. A. C.
Adams, John, . . . . .	New York, N. Y., . . . . .	18 Nutting Avenue.
Ahlstrom, Roger William, . . . . .	East Milton, . . . . .	9 Phillips Street.
Allen, Sidney Henry, . . . . .	Lynn, . . . . .	35 East Pleasant Street.
Arp, Richard Dietrich, . . . . .	Amherst, . . . . .	30 Cottage Street.
Belcher, Edgar Estes, . . . . .	East Weymouth, . . . . .	Care of E. F. Gaskill.
Bell, William T. A., . . . . .	Dorchester, . . . . .	101 Pleasant Street.
Betterley, Guy William, . . . . .	Brattleboro, Vt., . . . . .	70 Lincoln Avenue.
Bligh, Norman Francis, . . . . .	Boston, . . . . .	29 East Pleasant Street.
Blish, Stanley Frye, . . . . .	Brookline, . . . . .	9 Phillips Street.
Bosworth, Earl Kenneth, . . . . .	North Orange, . . . . .	5 Fearing Street.
Breivogel, Henry Adam, . . . . .	Jamaica Plain, . . . . .	4 Chestnut Street.
Bresnahan, John Francis, . . . . .	Malden, . . . . .	Colonial Inn.
Brown, Frederick Davis, . . . . .	Webster, . . . . .	32 North Prospect Street
Brown, Milton Shumway, . . . . .	Templeton, . . . . .	8 Kellogg Avenue.
Burke, James Andrew, . . . . .	Dorchester, . . . . .	3 North Prospect Street.
Cahill, Paul Bennett, . . . . .	Waltham, . . . . .	6 Nutting Avenue.
Carlson, Lewis, . . . . .	Gloucester, . . . . .	35 North Prospect Street.
Carlson, Oscar, . . . . .	Sweden, . . . . .	66 Pleasant Street.
Castillo, Aristides Henry, . . . . .	El Salvador, C. A., . . . . .	101 Pleasant Street.
Castillo, Joseph A., . . . . .	El Salvador, C. A., . . . . .	101 Pleasant Street.
Chamberlain, Bert N., . . . . .	Hudson, . . . . .	25 North Prospect Street.
Clark, William Guster, . . . . .	Amherst, . . . . .	12 Beston Street.
Clifford, Lura Marion, . . . . .	Boston, . . . . .	Adams House.
Cluff, Victor Newton, . . . . .	Dracut, . . . . .	8 Kellogg Avenue.
Condon, Thomas Casey, . . . . .	Medford, . . . . .	25 North Prospect Street.
Convery, Edward Francis, . . . . .	Charlestown, . . . . .	47 North Pleasant Street.
Crossman, Laurence Stephens, . . . . .	Springfield, . . . . .	7 Nutting Avenue.
Crowell, Elbridge Hodgman, . . . . .	Wollaston, . . . . .	29 East Pleasant Street.
Cushman, John Kenneth, . . . . .	Springfield, . . . . .	8 Kellogg Avenue.
Davenport, Aris Elizabeth, . . . . .	Dorchester, . . . . .	Adams House.
David, James Vernon, . . . . .	Amherst, . . . . .	24 Belchertown Road.
DeLano, Wilbert Kilbourn, . . . . .	Richmond Hill, N. Y., . . . . .	32 North Prospect Street.
Doane, Smith Eaton, . . . . .	Worcester, . . . . .	8 Kellogg Avenue.
Donovan, Albert Peter, . . . . .	Canada, . . . . .	36 North Prospect Street.
Downey, Francis William, . . . . .	Boston, . . . . .	34 Pleasant Street.
Erickson, Karl Henrich, . . . . .	Somerville, . . . . .	29 Lincoln Avenue.
Farrow, Henry Grindle, . . . . .	Rockport, Me., . . . . .	70 Lincoln Avenue.
Fitzgerald, Edward John, . . . . .	Fitchburg, . . . . .	101 Pleasant Street.
Flagg, Nolan Randolph, . . . . .	Worcester, . . . . .	12 McClure Street.
Flaherty, Martin Robert, . . . . .	Wamesit, . . . . .	50 Lincoln Avenue.
Fletcher, Robert Longard, . . . . .	Stow, . . . . .	70 Lincoln Avenue.
Galbraith, Hermon William, . . . . .	South Hadley, . . . . .	15 Hallock Street.
Gamege, John Carter, . . . . .	Portland, Me., . . . . .	27 Fearing Street.
Gauthier, Francis Joseph, . . . . .	Boston, . . . . .	36 North Prospect Street.
Geromonty, Francis Howard, . . . . .	Stoneham, . . . . .	101 Pleasant Street.
Gokey, Emery, . . . . .	Rutland, Vt., . . . . .	17 Phillips Street.
Grant, Nelson Atherton, . . . . .	Indian Orchard, . . . . .	Box 114, North Amherst.
Green, George Alex, . . . . .	Cambridge, . . . . .	18 Nutting Avenue.
Griffin, Charles Mathew, Jr., . . . . .	Westford, . . . . .	15 Hallock Street.
Grimee, George Robert, . . . . .	Nantucket, . . . . .	40 Mount Pleasant.
Gustafson, Gustaf Albert, . . . . .	Wilmington, . . . . .	Care of M. W. Hoyt, North Amherst.
Hamilton, Weston Alexander, . . . . .	Salem, . . . . .	13 Phillips Street.
Harrington, Walter Peck, . . . . .	North Amherst, . . . . .	Meadow Street.
Harrington, William John, . . . . .	Rutland, Vt., . . . . .	Box 77, North Amherst.
Harrison, Nicholas Peter, . . . . .	London, Eng., . . . . .	45 Pleasant Street.
Hartwell, John Redman, . . . . .	Lincoln, . . . . .	3 Eames Avenue.
Hasbrook, Stephen Leaybron, Jr., . . . . .	Amherst, . . . . .	Baker Street.
Hasbrouck, Ethel Edwards, . . . . .	Amherst, . . . . .	5 Paige Street.
Headberg, Axel Edward, . . . . .	West Somerville, . . . . .	116 Pleasant Street.

Hoald, Edwin Tracy, . . .	Ashburnham, . . .	6 Maple Avenue.
Hibbard, Perloy, . . .	Dodham, . . .	31 East Pleasant Street.
Hurd, Merton Bartlett, . . .	Spencer, . . .	4 Chestnut Street.
Jacomb, Constance Lucy, . . .	Groton, . . .	Adams House.
Jaecle, Matthew Laurence, . . .	Nantucket, . . .	40 Mount Pleasant.
Joe, James Balmain, . . .	East Milton, . . .	34 Pleasant Street.
Jordan, Llowellyn Powers, . . .	Bar Harbor, Mo., . . .	8 Kellogg Avenue.
Keating, Joseph Michael, . . .	Williamansett, . . .	4 Chestnut Street.
Keirstead, Ralph Ramsay, . . .	Worcester, . . .	4 Chestnut Street.
Keith, George Robert, . . .	West Boylston, . . .	29 Lincoln Avenue.
Kemble, Winslow, . . .	Marblehead, . . .	21 Fearing Street.
Kessili, Howard Maxwell, . . .	Worcester, . . .	12 McClure Street.
Kinder, Laurence Philip, . . .	Saxonville, . . .	51 Amity Street.
Knight, Allen, Jr., . . .	Amherst, . . .	29 East Pleasant Street.
Knightly, George Thomas, . . .	Amherst, . . .	12 Clifton Avenue.
Kohlrausch, George Edwin, . . .	Chelsea, . . .	2 McClellan Street.
Labrovitz, Max Browdy, . . .	Amherst, . . .	11 Amity Street.
Leavitt, Dorothy Wilmer, . . .	Whitman, . . .	Adams House.
LeBallister, Ralph Hammond, . . .	Concord, . . .	16 Amity Street.
Lincoln, Edward Joshua, . . .	Spencer, . . .	35 East Pleasant Street.
Lolley, Horace Jim, . . .	Pelham, . . .	Harkness Road, Box 134.
Loring, Frank Sumner, . . .	Gloucester, . . .	35 North Prospect Street.
Maggi, Joseph Francis, . . .	Holyoke, . . .	4 Chestnut Street.
Mans, Charles William, . . .	South Royalton, Vt., . . .	18 Nutting Avenue.
Margreve, Frederick Nicholas, . . .	Cambridge, . . .	53 Lincoln Avenue.
Markham, Albert Gallitin, . . .	Springfield, . . .	North Amherst.
McKenna, George Earle, . . .	Orange, . . .	36 North Prospect Street.
McKenna, Philip James, . . .	Hyde Park, . . .	47 Chestnut Street.
Moore, Lloyd Weymouth, . . .	Worcester, . . .	McClure Street.
Motyka, John Joseph, . . .	Amherst, . . .	26 Cottage Street.
Nettleton, Francis Irving, Jr., . . .	Shelton, Conn., . . .	13 Fearing Street.
Norton, Frances Close, . . .	Salisbury, Conn., . . .	Adams House.
Packard, Marjory Emma, . . .	Ashfield, . . .	Adams House.
Palmer, Justin, . . .	Lowell, . . .	Baker Place.
Parsons, Howard Joel, . . .	Conway, . . .	13 Fearing Street.
Partenoff, Christo, . . .	Middleborough, . . .	36 North Prospect Street.
Perry, Gardner, Jr., . . .	Dedham, . . .	3 McClellan Street.
Pollock, Gordon Standley, . . .	Salem, . . .	12 McClure Street.
Powell, Katharine Leslie, . . .	Boston, . . .	Adams House.
Power, Maurice Joseph, . . .	Amherst, . . .	36 North Prospect Street.
Prescott, William H., . . .	Holyoke, . . .	8 Kellogg Avenue.
Preston, John Dabney Stuart, . . .	Wytheville, Va., . . .	8 Kellogg Avenue.
Ramsdell, Kenneth Hammond, . . .	Southville, . . .	116 Pleasant Street.
Ripley, David Hamilton, . . .	Blandford, . . .	27 Fearing Street.
Ritchie, Harry Ellsworth, . . .	Rutland, Vt., . . .	North Amherst, Box 77.
Robinson, George Sutherland, . . .	Lynn, . . .	25 North Prospect Street.
Ross, Ian Hamilton, . . .	New York, N. Y., . . .	66 Pleasant Street.
Russell, Byron Roberts, . . .	Brimfield, . . .	30 North Prospect Street.
Russell, Elizabeth F., . . .	Boston, . . .	Adams House.
Sanford, Paul Reed, . . .	Stamford, Vt., . . .	56 Main Street.
Sargent, Edna May, . . .	Chelmsford, . . .	Adams House.
Savcheff, Andrew, . . .	Springfield, . . .	56 Pleasant Street.
Sayles, Arthur Updike, . . .	Providence, R. I., . . .	3 Pleasant Street.
Schlit, Henry, . . .	Northampton, . . .	52 William Street, Northampton.
Seaver, Harold Davidson, . . .	Agawam, . . .	84 Pleasant Street.
Sherwood, Joseph Morgan, . . .	Huntington, . . .	17 Kellogg Avenue.
Slate, Herbert Taylor, . . .	Bernardston, . . .	21 Fearing Street.
Smith, Willard Stevenson, . . .	Westboro, . . .	35 East Pleasant Street.
Sprague, Morrill Goodwin, . . .	Harvard, . . .	18 Nutting Avenue.
Standley, Wallace, . . .	Middleton, . . .	29 Lincoln Avenue.
Stuart, Frances Elizabeth, . . .	Bangor, Me., . . .	Adams House.
Sullivan, Joseph Stephen, . . .	Holyoke, . . .	56 Pleasant Street.

Sullivan, Patrick William, . . .	Amherst, . . .	54 Cottage Street.
Sutton, Samuel Carleton, . . .	Needham, . . .	101 Pleasant Street.
Thompson, Burton Elmer, . . .	West Somerville, . . .	21 Amity Street.
Thouin, Faina Gladys, . . .	Easthampton, . . .	Adams House.
Tompkin, Harry Wilson, . . .	Newton Upper Falls, . . .	44 High Street.
Tyzzar, Gerald Edwards, . . .	Wakefield, . . .	41 Lincoln Avenue.
Vaber, John Edward, . . .	Lee, . . .	North Amherst.
Wells, Alphonsus, . . .	Malden, . . .	12 Boston Street.
Wheeler, John Walter, . . .	Cooperstown, N. Y., . . .	15 Fearing Street.
Whidden, Ralph Edward, . . .	Amherst, . . .	East Pleasant Street.
White, Donald Mitchell, . . .	Winthrop, . . .	5 Nutting Avenue.
Wholly, Roger Timothy, . . .	Cambridge, . . .	North Amherst.
Willet, Frederick William, . . .	Lowell, . . .	16 Amity Street.
Williams, Archie, . . .	Westfield, . . .	84 Pleasant Street.
Wilson, Frank Edward, . . .	Warren, . . .	5 Nutting Avenue.
Wilson, Harold Elton, . . .	Graniteville, Vt., . . .	15 Phillips Street.
Woodward, Paul Nelson, . . .	Princeton, . . .	15 Hallock Street.
Woodworth, Ralph Merrill, . . .	Rowley, . . .	17 Kellogg Avenue
Worthley, James Everett, . . .	Wakefield, . . .	Care of H. N. Worthley, Mount Pleasant.
Wyman, Francis, . . .	Medford, . . .	17 Kellogg Avenue.

## VOCATIONAL POULTRY COURSE, 1920-21.

Adams, David Lloyd, . . .	Springfield, . . .	Hillside Avenue, R. F. D. 126.
Ashforth, Arthur Clifton, . . .	Brockton, . . .	Poultry Department, M. A. C.
Bartholomew, Francis Michael, . . .	Amherst, . . .	13 Amity Street.
Beaulieu, Frederick Armond, . . .	North Attleborough, . . .	9 Gray Street.
Brown, Joseph Harry, . . .	Killingly, Conn., . . .	1 Pease Avenue.
Corcoran, James Joseph, . . .	Boston, . . .	36 North Prospect Street.
D'Amelio, George, . . .	Milford, . . .	35 East Pleasant Street.
Davis, John Andrew, . . .	Amherst, . . .	13 Amity Street.
Dinneen, Walter James, . . .	Revere, . . .	101 Pleasant Street.
Fournier, Arthur, . . .	Hawley, . . .	1 Pease Avenue.
Hunter, Charles O., . . .	Stoneham, . . .	R. F. D. 126.
King, Robert Ferri-, . . .	Amherst, . . .	5 Hitchcock Street.
Leonard, John Francis, . . .	Amherst, . . .	47 Chestnut Street.
McCave, Herbert William, . . .	Boston, . . .	116 Pleasant Street.
McHugh, John Edward, . . .	New Bedford, . . .	27 Fearing Street.
O'Brien, Charles Pierce, . . .	Everett, . . .	35 North Prospect Street.
Parsons, Norman Chestor, . . .	Everett, . . .	9 Gray Street.
Richards, Isaac, . . .	Longbeach, Cal., . . .	27 Fearing Street.
Whitford, Ralph Collins, . . .	Lowell, . . .	20 Lessey Street.

## WINTER SCHOOL, 1920.

Adams, Alpheus R., . . .	Northborough.
Adjeleian, Harry, . . .	Worcester.
Allen, Mrs. Caleb D., . . .	Williamsburg.
Allen, Caleb D., . . .	Williamsburg.
Allen, Ralph C., . . .	Longmeadow.
Allison, Nathan K., . . .	Granby, Conn.
Baldwin, Kenneth L., . . .	Wilton, N. H.
Barton, Elmer B., . . .	Keene, N. H.
Barton, Harold J., . . .	Keene, N. H.
Bertucio, Stevon, . . .	Fitchburg.
Bishop, Chas. R., . . .	Guilford, Conn.
Blanchard, Clifford B., . . .	Abington.
Boothby, Richard P., . . .	Dorchester.
Bradley, Dean H., . . .	Ilion, N. Y.
Brown, Howard B., . . .	Dunstable.

Butlor, Frank H.,	Norwich, Conn.
Camp, Emily B.,	Springfield.
Carlson, Ralph H.,	Northampton.
Cartwright, Calton O.,	Providence, R. I.
Chace, Maude,	Oxford.
Chaffee, Norman F.,	Bolton.
Chapel, Walter,	Boston.
Chappell, Simon,	East Milton.
Cleare, Lawrence,	
Cobb, Chas. E.,	
Cobb, Mary C.,	
Conroy, Annie,	New Bedford.
Cook, Ashley L.,	Hadley.
Cooley, Burton L.,	Granville Center.
Cornwall, Lester W.,	Medway.
Cowan, Elisabeth B.,	Amherst.
Craig, Dexter H.,	Plymouth.
Crowell, Marcus L.,	East Dennis.
Deutsch, Miriam,	Baltic, Conn.
Emerson, Helen,	Providence, R. I.
Exley, Lucius M.,	Plainfield, Conn.
Filer, Walter S.,	South Hadley Falls.
Fiske, Wm. M.,	Amherst.
Fitzmorris, Joseph,	Whitfield, N. H.
Forbes, Alice H.,	Milton.
Grant, Grace,	Sharon.
Greene, Robert A.,	Vinalhaven, Me.
Grover, Alonzo P.,	Rockport.
Gustin, B. F.,	North Amherst.
Haig, John B.,	Chicopee Falls.
Hall, Helen,	Milton.
Harris, Harry E.,	Methuen.
Hart, Adrian P.,	Cambridge.
Hart, Albert B.,	Cambridge.
Hayes, Geo. F.,	Tariffville Center, Conn.
Hofer, Chas. E.,	Zurich, Switzerland.
Howard, Marguerite F.,	Danvers.
Howard, Ralph W.,	Worcester.
Hubbard, Leland T.,	Middletown, Conn.
Hunt, Donald R.,	Newtonville.
Ives, William F.,	Amherst.
Jacobs, Albert F.,	Dudley.
Jacobsen, Victor J.,	Dorchester.
Joy, Henry F.,	Hartford, Conn.
Knowles, Frank P.,	Dorchester.
Ladd, Chas. P.,	Pike, N. H.
Landstrom, Oscar N.,	Heath.
Lerner, Harry N.,	Peru.
LeValley, Sarah H.,	Hope, R. I.
Lord, Reginald L.,	Lyme, Conn.
Lowry, Floyd P.,	Williamstown.
MacRae, Rena N.,	Wilmington, N. C.
McGrath, Elsie,	Rockport.
Nelson, Carl A.,	Roslindale.
Nye, Henry C.,	Springfield.
Olds, George W.,	Middlefield.
Ostrander, George B.,	Auburn, N. Y.
Otterbein, Wm. Lewis,	Orange, N. J.
Perrins, Wm. A.,	Jamaica Plain.
Pollard, LeRoy H.,	New Braintree.
Poor, Nathan H.,	Danvers.
Porter, Philip C.,	West Springfield.
Prentiss, Bertha H.,	Holyoke.
Ramsey, Samuel,	Boston.

Reid, Hay B., . . . . .	Osterville.
Robinson, Eben G., . . . . .	Edgewood, R. I.
Robinson, Eva M., . . . . .	Petersham.
Samson, Josephine, . . . . .	Greenfield.
Sanders, Hector G., . . . . .	South Boston.
Scandrett, Jay M., . . . . .	Highwood, N. J.
Schatz, Phoebe, . . . . .	Yantic, Conn.
Simpson, Geo. W., . . . . .	Wallingford, Conn.
Skillings, Susan C., . . . . .	Amherst.
Sliter, Oscar R., . . . . .	Montague.
Spofford, Fred R., . . . . .	Georgetown.
Stearns, Horace D., . . . . .	Waltham.
Stocking, Albina M., . . . . .	Springfield.
Stocking, James F., . . . . .	Springfield.
Strang, James H., . . . . .	Clinton.
Sullivan, Raymond J., . . . . .	Bondsville.
Sutton, Lawrence, . . . . .	Plainfield, N. J.
Tent, James, . . . . .	Hatchville.
Tilton, E. B., . . . . .	Boston.
Townsend, Ethelyn, . . . . .	Cambridge.
Tufts, James W., . . . . .	South Amherst.
Upham, Ray D., . . . . .	Florence.
Wheeler, Sol C., . . . . .	Litchfield, Conn.

## PROFESSIONAL IMPROVEMENT COURSE FOR TEACHERS, JANUARY, 1920.

*Two Weeks.*

Glover, Theodore Whitford, . . . . .	North Easton.
Harvey, Samuel Hugh, . . . . .	Brimfield.
Houston, A. G. Arthur, . . . . .	West Springfield.
Howard, Ernest Albert, . . . . .	Peabody.
Loring, William Rupert, . . . . .	Great Barrington.
Lundgren, Robert Arthur, . . . . .	Orange.
Mayo, William Irving, Jr., . . . . .	Plymouth.
Mitchell, Robert Ambrose, . . . . .	Danvers.
Salter, James, . . . . .	Walpole.
Tomlinson, Bertram, . . . . .	Concord.

## SUMMER SESSIONS, 1920.

*Four and Six Weeks' School.*

Abbott, Florence I., . . . . .	Andover.
Acton, Kathryn I., . . . . .	Framingham.
Acton, Sara V., . . . . .	Framingham.
Adams, Clarice M., . . . . .	Colrain.
Adams, Esther F., . . . . .	West Warren.
Adams, Sarah A., . . . . .	Hardwick.
Alley, Evelyn L., . . . . .	Hyde Park.
Archer, Mary E., . . . . .	Salem.
Argood, Roy T., . . . . .	Walpole.
Arp, Esther W., . . . . .	Amherst.
Atkins, May L., . . . . .	Charlemont.
Bailey, Ritie L., . . . . .	East Deerfield.
Ball, Lorin E., . . . . .	Amherst.
Barker, Marjorie, . . . . .	Amherst.
Barney, Laura E., . . . . .	Amherst.
Berman, Dora, . . . . .	Holyoke.
Bicknell, Robert W., . . . . .	Newton Highlands.
Boorn, Eloise H., . . . . .	Adams.
Bowen, Harriet A., . . . . .	Fall River.
Brennan, Ellen G., . . . . .	Bradstreet.
Britton, Carrie G., . . . . .	Springfield.
Buchanan, Walter G., . . . . .	Chicopee.

Butterworth, Carolyn E.,	Amherst.
Camp, Emily B.,	Norwich, Conn.
Chace, Sarah M.,	Brookline.
Chapin, Marguerite,	Florence.
Clark, Dorothy P.,	Newton.
Cloroty, Nellie A.,	Brockton.
Coo, Alice E.,	Southampton.
Coffin, Charlotte,	Dorchester.
Coleman, Carl L.,	Winsted, Conn.
Coolidge, Lucy L.,	Wollaston.
Cooper, Gladys V.,	Athons, Pa.
Corey, Eva L.,	Amherst.
Coylo, Agnes H.,	Fall River.
Coyle, Florence K.,	Fall River.
Crafts, Eleanor E.,	Whately.
Crockett, Grace F.,	Pomfret, Vt.
Cronan, Alice E.,	Chicopee.
Cross, Mazie E.,	Chester.
Curtis, Betsey P.,	Gloucester.
Dalton, Mary E.,	Northfield.
Daniels, Agnes E.,	Worcester.
Danskin, Edith L.,	Melrose Highlands.
Davis, Elizabeth I.,	Taunton.
Davison, Paula H.,	Laporte, Ind.
Day, Laura G.,	Warren.
Day, Marion L.,	Warren.
Dickinson, Ame S.,	Amherst.
Doane, Delia S.,	Wallingford, Conn.
Dorntee, Marie L.,	Arlington.
Dwight, Susan H.,	Griswoldville.
Emerson, Louise K.,	Braintree.
Fairman, Frances L.,	Amherst.
Faneuf, Helen S.,	Lowell.
Farley, Alice J.,	Boston.
Farrar, Harry A.,	Middleton.
Farrell, Albert L.,	Worcester.
Fisk, Emma W.,	Charlemont.
Fitman, Anna G.,	Worcester.
Flaherty, Marguerite A.,	Hadley.
Flaherty, Mary E.,	Hadley.
Flynn, Elizabeth C.,	Malden.
Follette, Miriam A.,	Great Barrington.
Fox, Kathryn B.,	Athol.
Frellick, Arthur L.,	Everett.
Frellick, Ralph S.,	Everett.
Gardner, Blanche,	Northampton.
Gifford, George E.,	Middleton.
Gifford, John E.,	Sutton.
Glazier, Leta M.,	Amherst.
Gleason, Grace E.,	North Heath.
Glynn, Leo D.,	East Longmeadow.
Graves, Benjamin R.,	Northampton.
Graves, Stephen M.,	New London, Conn.
Greene, Jessie M.,	Marlborough.
Greene, Louise D.,	Boston.
Hall, Helen,	Milton.
Hamblett, Florence I.,	Attleboro.
Hamblett, Marion S.,	Attleboro.
Harrington, Carrie B.,	Amherst.
Harrington, Mary L. V.,	Fall River.
Haven, Viola E.,	Athol.
Hickey, Charles,	Cushman.
Holliday, Rebecca F.,	Boston.
Horr, May E.,	North Prescott.

Houghton, Irene V., . . . . .	Brockton.
Howard, Anne R., . . . . .	Braintree.
Howlett, Cora M., . . . . .	South Amherst.
Hunt, Blanche L., . . . . .	Charlemont.
Jarrett, Thomas D., . . . . .	Preston, Va.
Kingsley, Marjorie A., . . . . .	Monroe Bridge.
Kroeck, Julius, Jr., . . . . .	Huntington, N. Y.
Lavalette, Edith A., . . . . .	Malden.
Linehan, Mary L., . . . . .	Amherst.
Lomax, Maud H., . . . . .	Washington, D. C.
Loomis, Elsie M., . . . . .	Ashland.
Lord, Marguerite L., . . . . .	Petersham.
Lou, Chang H., . . . . .	Tientsin, China.
Luke, Myra D., . . . . .	Amherst.
Lynch, Alexander J., . . . . .	Fitchburg.
Mallorey, Alfred S., . . . . .	East Lynn.
Maxwell, Robert W., . . . . .	Woodstock, N. B., Can.
McHugh, Catharine A., . . . . .	Worcester.
McIntire, Mary M., . . . . .	Salem.
Monahan, Christine H., . . . . .	Shelburne Falls.
Monteith, Agnes M., . . . . .	Natick.
Montesanto, John E., . . . . .	Melrose.
Mooney, Miles, . . . . .	Worcester.
Moore, Margaret B., . . . . .	Amherst.
Moriarty, Mary T., . . . . .	Greenwich, Conn.
Murphy, Agatha, . . . . .	Brookline.
Nakagawa, Hisamoto, . . . . .	Tokyo, Japan.
Neill, Jessie A., . . . . .	Amherst.
Nelson, Dora E., . . . . .	Greenfield.
Newlon, Charlotte R., . . . . .	Amherst.
Newton, Clara W., . . . . .	Amherst.
Nixon, Leonard R., . . . . .	Exeter, N. H.
Norrington, Ruth O., . . . . .	Amherst.
Nowlan, Elizabeth T., . . . . .	Amherst.
Nugent, Gertrude V., . . . . .	Boston.
O'Brien, Helen A., . . . . .	Westfield.
O'Brien, Katherine M., . . . . .	Dorchester.
Park, Emma F., . . . . .	Mittineague.
Parsons, Elgie R., . . . . .	Northampton.
Patterson, Beulah E., . . . . .	Amherst.
Paul, Eva J., . . . . .	Shelburne Falls.
Perkins, Myrtle J., . . . . .	Shelburne Falls.
Prand, Catherine, . . . . .	Roxbury.
Prand, Rosa M., . . . . .	Roxbury.
Quimby, Cora M., . . . . .	Amherst.
Ray, Ruth E., . . . . .	Amherst.
Richards, Doris, . . . . .	Orange.
Richards, Viola F., . . . . .	South Deerfield.
Richards, Vivian B., . . . . .	Orange.
Ricks, Launard E., . . . . .	Amherst.
Robbins, Mildred J., . . . . .	Amherst.
Rodway, Ruth L., . . . . .	Amherst.
Russell, Ruth H., . . . . .	Northborough.
Ryan, Teresa, . . . . .	Fall River.
St. George, Augustin, . . . . .	Chicopee.
Sanctuary, William C., . . . . .	Amherst.
Sanford, Alice P., . . . . .	Newark, N. J.
Schneider, Katherine A., . . . . .	Great Barrington.
Scott, Nina F., . . . . .	Worcester.
Shaw, G. Eleanor, . . . . .	Woburn.
Shaw, George J., . . . . .	Lucknow, India.
Sheridan, Katharine E., . . . . .	Wellesley Hills.
Sidney, Luella C., . . . . .	Wakofield.
Skillings, Susan H., . . . . .	Amherst.



Smart, Harold W.,	Amherst.
Smith, Emily D.,	Amherst.
Smith, Irene I.,	Somerville.
Spencer, Miriam I.,	Springfield.
Stacbnor, Emerson,	Willimantic, Conn.
Stowell, Harold T.,	New Salem.
Stowell, Margaret B.,	New Salem.
Stratton, Alice I.,	Framingham.
Sullivan, Mary D.,	Fall River.
Sumner, Margaret L.,	Braintree.
Suprenant, Valmore J.,	Adams.
Swain, Caroline M.,	Wilmington.
Swain, Henrietta A.,	Wilmington.
Thompson, Lulu B.,	West Somerville.
Titus, Alice H.,	Mittineague.
Twiss, Marion D.,	Worcester.
Upham, Esther N.,	Melrose.
VanPiper, Susie,	South Hadley Falls.
Verder, Bessie C.,	Mattapoissett.
Verder, Daniel H.,	Mattapoissett.
Walsh, Bertha H.,	Amherst.
Wang, Hsin Y.,	Tientsin, China.
Ward, Vivian I.,	Buckland.
Warren, Helen A.,	Grafton.
Wells, Reuben F.,	Hatfield.
Wheeler, Dorothy L.,	Bardwells Ferry.
Whitlock, Mildred W.,	Cleveland, Ohio.
Whitney, Jennie M.,	North Adams.
Wilde, Cora L.,	Fall River.
Wilde, Mildred F.,	Fall River.
Wilkes, Dorothy E.,	Bridgeport, Conn.
Wilkes, Otis R.,	Bridgeport, Conn.
Williams, Etta L.,	Southampton.
Wright, Gladys H.,	Watertown.
Wright, Nina K.,	Bellows Falls, Vt.
Zass, Anna I.,	Holyoke.

*Eight Weeks' Summer School for Two-year Students.*

Allen, Chester C.,	Amherst.
Atwood, Carl S.,	Medford.
Barney, Ernest W.,	Amherst.
Bartholemew, Francis M.,	Boston.
Boland, Albert M.,	Worcester.
Breen, Arthur J.,	Granby.
Brooker, John P.,	Roxbury.
Burke, Leslie J.,	Medford.
Cady, Howard M.,	South Shaftsbury, Vt.
Christensen, Frank W.,	North Easton.
Clarke, William J.,	Ipswich.
Colleary, Thomas P.,	Revere.
Connelly, Leo A.,	Waltham.
Corcoran, James J.,	Boston.
Corey, Raymond S.,	Amherst.
Crockor, Fred C.,	Amherst.
Daisy, Walter E.,	Roslindalo.
Davis, John A.,	Cambridge.
Dunleavy, Henry J.,	Boston.
Finn, William F.,	Chelsea.
Flynn, Harry J.,	Bennington, Vt.
Gallant, Daniel J.,	Gloucester.
Gamage, John C. F.,	Portland, Me.
Gaudette, Claude I.,	Amherst.
Graeff, Charles A.,	New York, N. Y.

Graumann, Lewis M.,	Roxbury.
Hartling, Wilfred L.,	Boston.
Hastings, John V.,	Amherst.
Hayden, Arthur L.,	Natick.
Igo, Bernard J.,	West Somerville.
Jacques, John W.,	Malden.
Jordan, Lewellyn P.,	Bar Harbor, Me.
Judge, Clarence P.,	Raynham.
Kaveney, Francis E.,	Hyde Park.
Knight, Henry E.,	Easton, Me.
Lawton, Edgar L.,	Brattleboro, Vt.
Lincoln, Leon P.,	Barre.
Lolley, Horace J.,	Pelham.
Lounsbury, Francis E.,	Cambridge.
Macomber, Donald A.,	Springfield.
Magoon, Austin W.,	Greensborobend, Vt.
Mayne, Joseph J.,	Brookline.
McHugh, John E.,	New Bedford.
Morse, Herbert E.,	Foxborough.
Mullen, Frank M.,	Fayville.
Narkin, Isadore,	Brockton.
Norrington, Henry,	Amherst.
Oakes, John J.,	Wellesley.
O'Brien, Charles P.,	Everett.
Olson, Nils T.,	Dorchester.
O'Neal, Fred,	Yakima, Wash.
Parent, Ely A.,	Springfield.
Pellis, Abraham,	Chelsea.
Priest, Atwood W.,	North Vassalboro, Me.
Quirk, William J.,	Waltham.
Raymond, Matthew G.,	Amherst.
Richards, Isaac,	Springfield.
Richards, Osgood S.,	Amherst.
Robinson, Leo V.,	Athol.
Rodwaye, George W.,	Amherst.
Savage, John F.,	Boston.
Sexton, John W.,	South Boston.
Steele, Percy H.,	Hopkinton.
Talbot, William J.,	Amherst.
Tipple, Albert N.,	Amherst.
Walsh, John, Jr.,	Bedford.
Waterman, Harry L.,	South Thomaston, Me.
Whitbeck, Henry,	Amherst.
White, Ralph H.,	Barnard, Vt.
Wilson, Harold E.,	Graniteville, Vt.
Wilson, Harvey W.,	Boston.

*Eight Weeks' Summer School for Unit-course Students.*

Adams, Lawrence Waro,	Swampscott.
Arp, Dietrich,	Amherst.
Bontley, George Carter,	Osterville.
Berry, Alverdo Dodge,	Melrose.
Brown, Joseph Harry,	Killingly, Conn.
Carlson, Oscar,	Sweden.
Chrisfield, Edward Richardson,	Needham.
Clark, William Gustor,	Amherst.
Costos, Charles Nicholas,	Brookline.
Coughlin, John Harold,	Beverly.
Coupard, Louis,	East Loxington.
Coury, Hatem Majim,	Springfield.
Crehan, Owen Joseph,	Onset.
Crowell, Bernard,	Amherst.
D'Amolio, George,	Milford.

Donovan, Albert Peter, . . . . .	Canada.
Fazio, Charles Edward, . . . . .	Springfield.
Fournier, Arthur George, . . . . .	Hawley.
Frappier, Victor Edward, . . . . .	Proctor, Vt.
Gauthier, Francis Joseph, . . . . .	Boston.
Gavett, George Billings, . . . . .	South Portland, Me.
Gibbons, William Frank, . . . . .	Fitchburg.
Gokey, Emory, . . . . .	Rutland, Vt.
Good, William John, . . . . .	Milo, Me.
Gustafson, Gustaf Albert, . . . . .	Wilmington.
Hagan, Patrick, . . . . .	Cambridge.
Hall, John Robert, . . . . .	South Boston.
Hamilton, Weston Alexander, . . . . .	Salem.
Hardy, John Joseph, . . . . .	Everett.
Hemond, Edward Joseph, . . . . .	Williamansett.
Herbert, John Edward, Jr., . . . . .	Everett.
Hulcup, William, . . . . .	Riverside, R. I.
Hunter, Charles Otis, . . . . .	Stoneham.
Irby, Daniel Harmon, . . . . .	Gardiner, Me.
Jordan, Emmett Philmore, . . . . .	Smithfield, Va.
Kane, Daniel, . . . . .	Boston.
Kelley, Patrick Leo, . . . . .	Boston.
Knight, Allen, Jr., . . . . .	St. Johnsbury, Vt.
Koloski, William Aloysius, . . . . .	Three Rivers.
Komla, Stanley, . . . . .	Cambridge.
Kovachovich, John Joseph, . . . . .	Boston.
Kruk, John Alexander, . . . . .	South Deerfield.
Leonard, John Francis, . . . . .	Newton.
Libby, George Ames, . . . . .	Sheffield, Vt.
Marino, Guiseppe, . . . . .	Boston.
Mason, Edwin Clark, . . . . .	Charlestown.
McCave, Herbert William, . . . . .	Boston.
McEntre, James Frederic, . . . . .	Boston.
McKenna, Philip James, . . . . .	Hyde Park.
Moczarski, Joseph, . . . . .	Holyoke.
Motyka, John Joseph, . . . . .	Lowell.
Partenoff, Christo, . . . . .	Middleborough.
Perry, Louis, . . . . .	Peabody.
Puopolo, Salvatore, . . . . .	Boston.
Riley, Joseph Frederick, . . . . .	Stoneham.
Robinson, Edward George, . . . . .	Springfield.
Sadowski, Stephan Anthony, . . . . .	South Boston.
Sandy, James Anderson, . . . . .	Worcester.
Trebeck, Thomas, . . . . .	Springfield, Vt.
Tronzo, Herbert, . . . . .	Rutland, Vt.
Tucker, Newton Elmer, . . . . .	Cambridge.
Unwin, Edward, . . . . .	East Dedham.
Whidden, Ralph Edward, . . . . .	Amherst.
Whitford, Ralph Collins, . . . . .	Lowell.
Wolf, Henry, . . . . .	Shirley.

## UNIT COURSE, SEPTEMBER, 1920.

Allen, Sidney Henry, . . . . .	Lynn, . . . . .	56 Pleasant Street.
Benson, John Melvell, . . . . .	Mt. Desert, Me., . . . . .	—
Bentley, George Carter, . . . . .	North Reading, . . . . .	56 Pleasant Street.
Bullock, James, . . . . .	Bristol, R. I., . . . . .	4 Chestnut Street.
Bushey, William Francis, . . . . .	Ashuelot, N. H., . . . . .	—
Carroll, Charles Raymond, . . . . .	Stoneham, . . . . .	9 Amity Street.
Clark, Leon Leathe, . . . . .	Plymouth, N. H., . . . . .	21 Northampton Road.
Clouthier, Edward, . . . . .	Brunswick, Me., . . . . .	36 North Prospect Street.
Considine, Francis Anthony, . . . . .	Watertown, . . . . .	116 Pleasant Street.
Costos, Charles Nicholas, . . . . .	Brookline, . . . . .	15 Phillips Street.
Coupard, Louis, . . . . .	Lexington, . . . . .	47 Chestnut Street.

Coury, Hatem Majim, . . .	Springfield, . . .	56 Pleasant Street.
Crehan, Owen Joseph, . . .	Roxbury, . . .	4 Chestnut Street.
Crowell, Bernard, . . .	North Amherst, . . .	Meadow Street.
Danske, Frank, . . .	Holyoke, . . .	Triangle Street.
Devio, Alexander Leo, . . .	North Amherst, . . .	Summer Street.
Dunbar, Albert Jarvis, . . .	Greenwood, R. I., . . .	4 Chestnut Street.
Fazio, Charles Edward, . . .	Springfield, . . .	75 Pleasant Street.
Gavett, George Billings, . . .	South Portland, Me., . . .	5 McClellan Street.
Gibbons, William Frank, . . .	Fitchburg, . . .	120 Pleasant Street.
Hagan, Patrick, . . .	Cambridge, . . .	4 Chestnut Street.
Haley, William Howard, . . .	Malden, . . .	3 Pleasant Street.
Hemond, Edward Joseph, . . .	Willimansett, . . .	56 Pleasant Street.
Herbert, John Edward, Jr., . . .	Everett, . . .	18 Nutting Avenue.
Holden, Robert Miller, . . .	Melrose Highlands, . . .	18 Walnut Street.
Irby, Daniel Harmon, . . .	Amherst, . . .	4 Chestnut Street.
Johnson, Carl Eugene, . . .	Gloucester, . . .	3 Nutting Avenue.
Jordan, Emmett Philmore, . . .	West Medford, . . .	101 Pleasant Street.
Keller, Earle Franklin, . . .	Augusta, Me., . . .	3 Eames Avenue.
Koloski, William Aloysius, . . .	Springfield, . . .	116 Pleasant Street.
Komla, Stanley, . . .	Cambridge, . . .	Triangle Street.
Kovachovich, John Joseph, . . .	Boston, . . .	69 Main Street.
Kruk, John Alexander, . . .	South Deerfield, . . .	South Deerfield.
Lagioniere, Ernest, . . .	Montague City, . . .	41 Pleasant Street.
Libby, George Amos, . . .	Ware, . . .	30 Cottage Street.
Marino, Guiseppe, . . .	Boston, . . .	56 Pleasant Street.
Mason, Edwin Clark, . . .	Charlestown, . . .	41 East Pleasant Street.
Peters, Lawrence, . . .	Kearsarge, N. H., . . .	3 Pleasant Street.
Roy, Leon Joseph, . . .	Lawrence, . . .	9 Amity Street.
Sadowski, Stephen, . . .	Boston, . . .	35 East Pleasant Street.
Sandy, James Anderson, . . .	Worcester, . . .	3 Nutting Avenue.
Shulver, Arthur, . . .	Pawtucket, R. I., . . .	36 Pleasant Street.
Silvi, Mariano, . . .	Providence, R. I., . . .	35 East Pleasant Street.
Stevenson, John, . . .	Worcester, . . .	4 Chestnut Street.
Trebeck, Thomas, . . .	Springfield, Vt., . . .	4 Chestnut Street.
Tucker, Newton Elmer, . . .	Cambridge, . . .	21 Amity Street.
Unwin, Edward, . . .	Amherst, . . .	26 Cottage Street.
Wadman, Loran Wood, . . .	Medford, . . .	4 Chestnut Street.
Walsh, William Harold, . . .	Jamaica Plain, . . .	3 Pleasant Street.
Wolf, Henry, . . .	Shirley, . . .	4 Chestnut Street.

UNIT COURSES, PRIOR TO SEPTEMBER, 1920.<sup>1</sup>

Babre, Charles Ivan, . . .	Carmi, Ill.
Bjurman, Carl Axel, . . .	Worcester.
Blomstrom, Ernest A., . . .	Providence, R. I.
Capaul, Jacob, . . .	Roxbury.
Carroccia, Albert, . . .	Providence, R. I.
Chamberlin, Gordon Sanford, . . .	Everett.
Conroy, Maurice, . . .	New Bedford.
Conway, Leo James, . . .	Forest Hills.
Crawford, James Francis, . . .	Springfield.
Dupuis, George Joseph, . . .	Leominster.
Dutra, Philip Augustus, . . .	Somerville.
Foy, James Patrick, . . .	Roxbury.
Greenfield, Abraham, . . .	-
Harvey, Clarence Walter, . . .	Somerville.
Kiely, Thomas Joseph, . . .	-
Lufkin, Harry Edward, . . .	Somerville.
Mercer, Richard William, . . .	New Bedford.
Perry, Jesse N., . . .	Boston.
Pettee, John Thomas, . . .	Medford.

<sup>1</sup> List does not include those who entered and stayed through the summer session.

Proctor, Fred, . . . . .	Middlebury, Vt.
Ruzzanenti, Joseph, . . . . .	Milford.
Sevigny, Eugene, . . . . .	Dorchester.
Shaw, Earle B., . . . . .	Medford.
Vaillancourt, Wilfred Joseph, . . . . .	Lawrence.

## STUDENTS REGISTERED AFTER THE CATALOGUE OF 1919 WAS PUBLISHED.

*Two-year Course.*

Briggs, Leslie Frank, . . . . .	Fitchburg.
Cedar, Harry, . . . . .	—
Coye, James Edward, . . . . .	Waltham.
Fanning, Raymond Vincent, . . . . .	Everett.
Fannon, Edwin Harvey, . . . . .	Natick.
Foote, Clarence Edward, . . . . .	Stratham, N. H.
Gately, James Joseph, . . . . .	Cambridge.
Hubbard, James Sumner, . . . . .	Sunderland.
Lasker, Samuel, . . . . .	Providence, R. I.
Lee, Ralph Waldo, . . . . .	Cambridge.
Lynch, Rodman Henry, . . . . .	Malden.
Marnell, Patrick Leo, . . . . .	Harrisville, N. H.
Oldfield, Amos William, . . . . .	Auburndale.
Rand, Fred James, . . . . .	Wayland.
Robinson, Benjamin, . . . . .	Springfield.
Shirtcliff, Samuel Michael, . . . . .	Montague City.
Swetland, Harvey Butler, . . . . .	Agawam.
Willard, John Bradford, . . . . .	Worcester.

*Vocational Poultry Course.*

Smith, Royce Walter, . . . . .	Boston.
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*Rural Engineering Course.*

Aubin, Joseph Octave, . . . . .	Keene, N. H.
Stone, Archie Wallace, . . . . .	North Hero, Vt.

## SUMMARY OF SHORT COURSE ENROLLMENT.

	Men.	Women.	Total.
Two-year Course, second year, . . . . .	125	10	135
Two-year Course, first year, . . . . .	130	12	142
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Winter School, 1920, . . . . .	90	22	112
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Eight Weeks' School for Two-year Students, . . . . .	71	—	71
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Totals, . . . . .	610	194	804
Counted twice, . . . . .	100	—	100
Totals, . . . . .	510	194	704



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MASSACHUSETTS  
AGRICULTURAL COLLEGE

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REPORT OF THE PRESIDENT  
AND OTHER OFFICERS OF  
ADMINISTRATION



1920



# THE M. A. C. BULLETIN AMHERST, MASSACHUSETTS

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## THE FIFTY-EIGHTH ANNUAL REPORT OF THE MASSACHUSETTS AGRICULTURAL COLLEGE

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PART I.—THE REPORT OF THE PRESIDENT  
AND OTHER OFFICERS OF ADMINISTRATION  
FOR THE FISCAL YEAR ENDED NOV. 30, 1920



PUBLICATION OF THIS DOCUMENT  
APPROVED BY THE  
SUPERVISOR OF ADMINISTRATION.

# The Commonwealth of Massachusetts

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DEPARTMENT OF EDUCATION, BOSTON, Feb. 15, 1921.

*To the Honorable Senate and House of Representatives.*

GENTLEMEN: — In accordance with the provisions of section 32 of chapter 30 of the General Laws, I transmit to you herewith, for the use of the General Court, the annual report of the Massachusetts Agricultural College for the year ending Nov. 30, 1920.

Respectfully yours,

PAYSON SMITH,  
*Commissioner of Education.*





# The Commonwealth of Massachusetts

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MASSACHUSETTS AGRICULTURAL COLLEGE,  
AMHERST, Nov. 30, 1920.

*To the Commissioner of Education.*

SIR:— On behalf of the trustees of the Massachusetts Agricultural College I have the honor to transmit herewith Part I of the fifty-eighth annual report of the trustees, for the fiscal year ended Nov. 30, 1920, this being the report of the president of the college and other officers of administration to the corporation.

Respectfully yours,

KENYON L. BUTTERFIELD,

*President.*



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## REPORT OF THE PRESIDENT OF THE COLLEGE.

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*Gentlemen of the Corporation.*

I herewith submit my annual report as President of the Massachusetts Agricultural College for the year ending Nov. 30, 1920, and with it transmit reports from other administrative officers of the institution.

### REVIEW OF THE YEAR.

#### **The Problems of the Last College Year.**

The collegiate year ending last June proved to be probably the most difficult the College has had to pass through in a long while. The war completely upset student life and even made serious inroads in the established procedure of the College staff. The morale and traditions of student work and activities had to be reconstructed. Athletics and other student activities had been in abeyance nearly three years. Two-thirds of the senior class was composed of students whose college career had been interrupted one or two years. Military drill was not popular with the men who had served in the army. The established lines of campus leadership had been broken or had disappeared. An unexpectedly large number of two-year students were brought into a college which had been "geared" to four-year work. The presence of soldier students sent by the Federal Board for Vocational Education, most of whom could not enter four-year courses, added another complication to the campus problems. The increase in women students brought at once to the front relations between men and women in the various phases of student government and life.

However, by the end of the year most of these problems were satisfactorily adjusted, and the new college year began in September with a fine feeling of co-operation and enthusiasm. The College is now operating upon a basis as nearly normal as could be expected.

Great credit is due to the students themselves, who through their own initiative helped to bring order out of chaos and a new spirit of co-operation out of many discordant elements. The faculty, as usual, has responded to the emergency, although laboring under great personal as well as official discouragements.

### **Change in Trustees.**

On Dec. 1, 1919, Dr. Arthur W. Gilbert succeeded Mr. Wilfrid Wheeler as Commissioner of the State Department of Agriculture, and consequently became a member of our Board of Trustees. Mr. Wheeler had been a member of the Board for nearly six years. Dr. Gilbert is a graduate of the College of the class of 1904, and brings to us the benefit of many years of successful experience in leadership in various agricultural activities.

### **Resignations.**

Elsewhere in this report will appear a discussion of the number of resignations which have occurred during the year, and of the effect of these resignations upon the work of the College. Special mention should be made, however, of the resignations of at least three of our men.

Prof. John C. McNutt, who since January, 1916, had been head of our Department of Animal Husbandry, resigned during the summer in order to accept a position as eastern representative for the American Short-Horn Breeders' Association. Professor McNutt was a good teacher, popular not only with his students but also with the farmers of the State. He was particularly interested in stock judging, and developed among our students judging teams who always competed most creditably with similar teams from agricultural colleges all over the country. Professor McNutt did much to improve the live stock of the College, and secured by gift many valuable animals.

Prof. William D. Clark resigned as professor and head of the Department of Forestry, having served in this position since 1912. Since that time the Mount Toby demonstration forest was secured, and under Professr Clark's direction the plans for forest management of that area were begun. During

the war Professor Clark served most acceptably as an assistant in the office of the Fuel Administrator for New England.

Prof. Robert W. Neal, who had been connected with the College since 1906, resigned in order to associate himself with the Home Correspondence School of Springfield. Professor Neal, during the early years of his service here, devoted his time to the teaching of English; later, as the field of agricultural journalism developed, Professor Neal was most active and successful in stimulating interest in this important study. Since the major in rural journalism was established he has had, each year, a group of men who became intensely interested in this work, and who, under Professor Neal's direction and inspiration, received excellent training. Professor Neal is the author of a number of important books.

#### **New Appointments as Department Heads.**

Attention should be called to the appointment of Mr. Sidney B. Haskell as director of the Experiment Station. Mr. Haskell is a graduate of the College of the class of 1904, and from the time of graduation until 1916 he was continuously associated with the College. The position in which he latest served us was that of professor of agronomy and head of the department. He was regarded by students and faculty alike as one of the most competent teachers of our staff, and was considered by the farmers of the State as one of our soundest and ablest authorities on questions of practical agriculture. From 1916 to 1920 Mr. Haskell was associated with the National Fertilizer Association, in which work he not only rendered service which brought the highest praise from his associates, but also made contacts throughout the country which greatly broadened his knowledge of agricultural affairs. Mr. Haskell in returning to the College has the full confidence and respect not only of his associates here, but also of the many alumni who are acquainted with him, and of the practical farmers of the State.

Mr. S. M. Salisbury was chosen to succeed Professor McNutt as head of the Department of Animal Husbandry. Mr. Salisbury graduated from the Ohio State University in 1913, and has had several years' successful experience in animal

husbandry. He was instructor at the North Carolina Agricultural College from 1913 to 1915; assistant professor at Ohio State University from 1915 to 1918; and served as county agent for Medina County, Ohio, from 1918 to 1920.

Mr. Laurencé R. Grose was chosen as head of the Department of Forestry to succeed Prof. W. D. Clark. Professor Grose graduated from Brown University and Harvard Forestry School, and has had ample experience as a teacher and in practical work in forestry.

### Enrollment of Students.

*In the Regular Courses.*—This autumn the enrollment of students in work of collegiate grade is 506. The entering class numbers 135, as compared with 125 in 1919. The enrollment in the graduate school is 48, there are 23 special and unclassified students, and 435 in the four-year course. There are 27 women students enrolled in the four-year course, 7 in the graduate school, and 3 as special or unclassified students, making a total of 37 doing work of college grade as compared with 30 in this classification a year ago.

*In the Two-year Course.*—The work of the two-year course is now well established and the course is continuing to meet with enthusiastic approval among the people of the State. This fall is the first year which finds us with two full classes enrolled in this course. In the autumn of 1919, 191 students enrolled in the first year of the two-year course. This autumn 133 of these have returned for the second year's work; in addition, a number of those who entered a year ago have, during the year, transferred to other courses. One hundred and forty-two have this autumn enrolled in the first year of the two-year course; 19 are registered in the special vocational poultry course; and there are 50 in the unit courses, organized primarily for those soldiers and sailors who cannot meet the requirements of the regular two-year course. Of the 277 two-year students 22 are women.

*In the Summer School and Other Short Courses.*—The Summer School of 1920 brought to the College more students than any similar course in the history of the College. There were 186 enrolled in the regular four and six weeks' school,



and 136 others registered in other courses organized for the summer months. For the second year the courses of the Summer School were developed in co-operation with the State Department of Education, and served as a training school for teachers of western Massachusetts and for others desiring special training in agriculture.

There were 112 enrolled in the Winter School of 1920. The total number of students enrolled in the Short Courses during the year was, including 23 who graduated in 1920, 727. This total suggests the extent to which the College is, through its various short courses, reaching the people of the State who are interested in agriculture, and it should be noted that the majority of those enrolled in all courses, except the Summer School, are interested in agriculture because of their purpose to return to the farm.

*Disabled Soldiers as Students.* — During the year the College has continued to co-operate with the Federal Board for Vocational Education in the training of a large number of disabled soldiers and sailors desiring an education in agriculture. During the year approximately 300 men have been in the College under the provisions of this co-operative plan, some of these remaining a month or two, while others have enrolled in both the two-year and the four-year courses.

*Total Enrollment.* — The total enrollment at the present time is 845, of whom 506 are enrolled in the work of college grade and 339 in the various short courses.

### **Commencement.**

The annual commencement exercises were held Monday, June 21. Mr. Frank A. Vanderlip of New York gave the commencement address. The graduating class was the largest in the history of the College, this fact being due largely to the return a year ago of so many men whose college course had been interrupted for one or two years by the war. The degree of bachelor of science was conferred on 109 men and 3 women. The faculty decided to award the degree of bachelor of science, *honoris causa*, to those students who had completed three years' work at the College, and who had subsequently served at least one year in the army or navy. Under this ruling nine men received this honorary degree and diploma.

### **The Honor System.**

One of the most heartening steps taken by our student body in a long while was developed almost entirely through student initiative and leadership last spring in the inauguration of the so-called "honor system" of examinations, by which the instructor leaves the whole question of cheating in examinations to the students themselves. The rules require that each student shall sign a pledge that he has not asked or given help in the test or examination. Cases of broken pledges are handled by a committee of the students, who make their recommendations to the disciplinary officers of the College. The plan is backed by strong public sentiment among the students, and constitutes a real achievement of student leadership. It embodies the best traditions of the institution.

### **Professional Improvement.**

Careful study has been given during the year to a plan for a somewhat new departure with respect to terms of employment of members of the staff of the institution, the chief feature of which is an opportunity for short leaves of absence for professional improvement. Details are now before your committee on course of study and faculty, having been approved by the administrative officers of the College.

### **Alumni Memorial Building.**

By the middle of May, 1920, the full amount of \$150,000 necessary for the Alumni Memorial Building had been pledged. This amount was subscribed by 1,150 graduates and former students, and by 750 students and friends of the institution. There were no large individual gifts made, and the percentage of students and alumni contributing relatively small amounts was exceptionally gratifying. Too high praise cannot be given or too great significance attached to the early decision on the part of the alumni to undertake this splendid task, and to the rapidity with which it was completed.

Work on the Memorial Building was started March 30, 1920, and while the progress appears to have been slow, it is probable that the building will be closed in by the first of January,

and that it can be completed in time for the dedication at Commencement in 1921. The corner stone was laid at Commencement in 1920, when notable addresses were made by Mr. Atherton Clark of the class of '77, chairman of the building committee, Mr. William Wheeler of the class of '71, and Dr. Joel E. Goldthwait of the class of '85.

### **The Semi-Centennial.**

Plans are rapidly developing for the celebration of the semi-centennial in June, 1921. This will be the fiftieth anniversary of the graduation of the first class. It was decided last spring to carry on a series of events during the year preceding the celebration, largely in the form of conferences on subjects that are just beginning to become of importance, and yet which thus far have not had very much discussion, together with certain special student and alumni features that would have particular bearing upon the idea of the celebration. Rather informally we have been calling this year of special activities our "Year of Jubilee." It began with the laying of the corner stone of the Memorial Building at Commencement in 1920. It was followed in July by a conference of editors of agricultural college publications. In October, at the time of the dedication of the Women's Building, a conference was held on "The Relation of Women to Agriculture and Country Life." In the same month an especially notable conference was held at which the College was host to the American Civic Association, which devoted its entire program of three days to the subject of country planning. On our invitation the American Country Life Association held its annual conference in Springfield, Mass., with one day of its program given at the College; also on our invitation the Land Grant College Association held its annual convention in Springfield, and on the last day of its meeting the entire body of official delegates were guests of the College.

Other conferences have been planned for the rest of the year. Records of these are being kept, and it is hoped that eventually there may be a small volume giving at least a résumé of the main features of what I believe will be regarded some day as a distinct contribution to important developments in the field of agriculture and country life.

### **World Aggie Night.**

In connection with the raising of the alumni fund for the Memorial Building there was held on Oct. 25, 1919, a "World Aggie Night," when there were reunions of M. A. C. men in some 22 cities and towns of the country. The affair was so successful that it was thought advisable to continue the plan another year. The date chosen this autumn was October 29. Records indicate that some 600 M. A. C. men gathered in 40 cities and towns, in 19 States, and also in Cuba, and in the Hawaiian Islands. The College sent representatives to eleven of these meetings in order that the groups might be informed of the work of the institution. For those reunions where it was impracticable to send a representative, information concerning the campus activities was prepared and transmitted by mail. It is hoped that this annual reunion may become a permanent affair.

### **The Co-operation of Alumni.**

The alumni are rallying to the support of the College as never before in its history. The alumni reunion at Commencement last June was not only the largest, but it was by far the most enthusiastic and the best organized since I have been connected with the College. There have been many other evidences of alumni aid, — the magnificent gift of Memorial Hall, the large attendance and great enthusiasm at the World Aggie Night dinners in October, and, more than all, the increasing number of personal and group evidences of interest and pledges of support. We need the backing of the alumni not only in persuading the Legislature to grant adequate financial support, but their counsel with regard to questions of policy and organization must prove to be increasingly helpful.

### **Legislative Appropriations.**

Tables submitted show the main items for annual maintenance appearing in the College budget of a year ago, together with the amounts granted and the amounts used. It will be observed that the total amount granted was \$115,000 short of that asked, and the amount used was \$4,000 less than the

appropriation. The estimate for coal was overrun by \$20,000, and the coal on hand Nov. 30, 1920, was 1,000 tons less than that of the same date a year before. The only way by which we prevented a much larger overdraft on our maintenance appropriation was by urging every department to cut its maintenance expenses "to the bone." The work of a number of departments has been seriously handicapped on this account. The appropriations for maintenance have by no means kept pace with the increased cost of labor and supplies, so that the unit expenditure is less than it was several years ago.

In the matter of personal service it will be observed that there is a net surplus of \$9,275; in instruction, approximately \$10,000; and in the Extension Service, over \$5,600. The overdraft in general maintenance of \$2,500 was due to the demand for increased wages for laborers which could not have been foreseen.

The Legislature of 1920 was requested to provide funds for a number of pressing building needs at the College, including both a chemistry building and a library. Because of the many other demands made upon the State treasury, both for current expenses and for new construction, it was thought necessary to postpone appropriations for our larger needs. The appropriations granted were \$15,000 for the construction of a cavalry barn, and \$50,000 for improvements and equipment. (See Table V.)

#### ANALYSIS OF EXPENDITURES.

On the basis of the Treasurer's report, an analysis of the expenditures of the College from State funds for the year ending Nov. 30, 1920, has been made, and the following tabulation indicates the total expenses and the per cent of the whole for the various classifications: —

CLASSIFICATION.	Total Ex- pense.	Per Cent.
Administration, . . . . .	\$54,593 27	7.4
Instruction, . . . . .	184,051 01	24.9
Short Courses, . . . . .	35,257 21	4.7
Experiment Station, including M. G. F. S., . . . . .	68,321 57	9.2
Extension Service, . . . . .	84,788 46	11.5

CLASSIFICATION.	Total Ex- pense.	Per Cent.
Heat, light and power, . . . . .	\$96,773 28	13.0
Farm, . . . . .	61,369 34	8.3
Other producing departments, . . . . .	81,405 99	11.0
Repairs, . . . . .	16,898 28	2.5
Trustee, travel and printing, . . . . .	2,439 66	.3
Control laws, . . . . .	21,768 81	2.9
General maintenance expense, . . . . .	32,046 39	4.3
Totals, . . . . .	\$739,713 27	100.0

### Improvements and New Construction.

The women's dormitory was completed this autumn. You will recall that the total appropriation was \$127,400. This was not sufficient to complete the building and fully equip it. The New England Branch of the Women's Farm and Garden Association came to our assistance and generously gave \$2,000 for furniture and furnishings for the living room. The building promises to be satisfactory and convenient. Forty-three girls are now rooming there.

The cavalry barn was completed late in the autumn. It is placed on a site on the Plainville Road a convenient distance from Lincoln Avenue. It was constructed on specifications furnished by the War Department.

Delays in building both of these structures were very annoying, but seemed to be due to very great difficulties contractors have been having in obtaining labor and supplies.

No other substantial improvements were provided, although a large number of minor improvements have been made possible through the appropriations of the last Legislature.

### The Departments of Undergraduate Instruction.

The teaching work in the departments of undergraduate instruction has continued during the year along much the same lines as formerly. Consideration has been given by the various divisions to the revision of the course of study for the degree of bachelor of science, in order that the objectives of the work might be more clearly defined and the method of reaching those objectives improved. The requirements for admission to

the College have been slightly revised after consultation with representatives of the State Department of Education. The new requirements will be found stated in the current issue of the College catalogue.

More and more demand is being made upon the departments in the Divisions of Agriculture and Horticulture for instruction for the two-year course, and a number of instructors have been added to more adequately carry on this work.

Practically every department in the College has during the year sustained a loss of one or more members of its staff; in many cases the efficiency of the work has been greatly impaired by such changes, and in other cases we have been obliged to omit certain important courses. The damaging effect upon the various departments of these numerous changes in staff cannot be overestimated. If the situation continues, it will not only greatly reduce the effectiveness of our institution, but will virtually cripple our teaching organization.

Another need which has been most pressing for many years, and which is now emphasized by the larger number of students which we have, is the lack of adequate facilities in certain departments in the way of laboratories and classrooms. A library is more than ever a most urgent need, as is also a new chemistry building, gymnasium and armory, and a suitable building for the Departments of Horticultural Manufactures and Pomology. In these and in many other departments the instruction now given is performed under conditions which lessen its effectiveness and make impossible the best economy in operation.

#### **Women's Work.**

The completion of the new dormitory for women students marks an epoch in the history of the College. It provides for 98 students, and will furnish an opportunity to develop social life among the girls which has been impossible heretofore. The women students take their meals at Draper Hall, which is located near the dormitory.

We are deeply indebted to the New England Branch of the Women's National Farm and Garden Association for their generous gift in the furnishings for the reception hall, living room and parlors in this dormitory. We are also indebted to

this association for scholarships offered to young women interested in the study of agriculture.

A large percentage of our women students avail themselves of the opportunity to elect courses in rural home life. The increasing interest in this work indicates that we must have larger facilities and ample teaching force for further development. We are in need of a practice house where home conditions and home problems may be duplicated as far as possible; also there is need of a gymnasium and some provision for outdoor athletics, such as a basketball court, tennis courts and hockey field.

#### **Work of the Agricultural Counselor for Women.**

We find that the number of agricultural positions which are open to women is considerably in excess of the number of women fitted to fill them. This and the good work already being done by those now in the field makes us feel that the College is affording women an opportunity to prepare themselves for important positions in agricultural work. Often women who come to the College have had little or no agricultural experience, and have no clear idea of the opportunities which agriculture offers them, or how to prepare for the work. For these women there is an opportunity to consult with an agricultural counselor for women, both in interviews and in classes.

#### **The Infirmary.**

The substantial increase in the number of men students is making constantly more pressing the long-standing problem of infirmary facilities. The presence on our campus of a number of women students brings an additional problem in this connection.

During the year it has been found necessary to employ two resident nurses instead of one, as was formerly the case. Because of the limitations of the present hospital buildings there is still no place where women students can be cared for, unless there are entire wards not utilized by men.

The construction of a first-class hospital with an adequate hospital force cannot long be delayed if we are to be equipped to adequately handle, not only a normal number of cases of



sickness occurring in a student body numbering 800 or 900, but also to meet the minimum requirements of the hospital in case of an epidemic. From the statistics furnished by the supervisor of the infirmary, it will be noted for the year just closing that 111 different students were treated at the infirmary as house patients, the aggregate number of days which they were confined being 653. In addition, 636 treatments were given to out-patients.

### **The Market-Garden Field Station.**

The year 1920 has been the most successful year in the history of the Market-Garden Field Station. Official projects have nearly all been carried through, exceptions being in connection with those to be directed by an entomologist. A man has not been available for this work. During the year there have been nearly a thousand visitors at the Market-Garden Field Station, including those who were present at the Field Day, August 4.

The work for the future is fairly definitely outlined, and may be summed up in the following projects: —

1. A study of the best methods of maintaining soil fertility, conducted under the name of the "Manure Economy Test."

2. The study of leading vegetable varieties as adapted to vegetable gardening in Massachusetts, with a comparison of the newer kinds.

3. A seed-production project, designed to determine the cost and value of home seed production, as compared with the use of seed purchased in the open market.

4. The study of green manure crops to determine their adaptability to vegetable gardening conditions.

5. Some special fertilizer studies peculiarly adapted to the vegetable gardening business, and which require demonstration where men can see them under closely controlled conditions.

6. The study of greenhouse lettuce production to determine —

- (a) The possibility of improving quality through the discovery of a better variety than that now used.

- (b) To experiment with growing conditions under glass to discover, if possible, some better combination than now in use to improve quality.

The greenhouse plant has been completed during 1920, with oil-burning installation. The administration building is sorely needed, and until it is available some types of the work must be more or less neglected.

Increased calls are being made on Professor Tompson for service throughout the State. The amount of correspondence is increasing. The demand at the Field Station is greater from season to season, and it is going to be necessary to have additional men engaged in vegetable gardening work. There has been splendid co-operation from growers throughout the State, and the interest in the work at the Market-Garden Field Station has easily doubled since the Field Day of August 4.

### **Library.**

During the year our inadequate library facilities have been somewhat amplified by the fitting up of the floor above the present library for reading room purposes.

Several thousand books have been transferred to the second floor, and a library assistant provided to care for the needs of students and faculty using this room. It should be emphasized that this adjustment is purely a makeshift, and that it relieves in a very minor degree the necessity for an adequate library building. The librarian reports that the more pressing needs for the library, in addition to a suitable building, are more books and other competent assistants to make available the library facilities.

The library now has 65,000 volumes, more than twice the number catalogued ten years ago.

There is a growing tendency on the part of the teachers and students alike to make use of the library as a common and necessary laboratory, and it is unfortunate that this tendency cannot be more adequately met.

### **Department of Physical Education.**

I wish this report to call especial attention to the organization, work and needs of the Department of Physical Education, for its purpose is far more than management of athletics, important as that is.

The head of the Department of Physical Education is supervisor of athletics. The assistant professor is coach of varsity athletics. There is an instructor in general charge of all two-year athletics, and another of all Freshman athletics. There is also supply man and clerk of the department.

Student voluntary participation in outdoor athletics has greatly increased, especially since supervision by department members has been provided for the major sports. Only one major branch of athletics is without full supervision. This is in track athletics, where the instructor is able to give only the time after 5 o'clock each day for this work. Track athletics should be one of the major sports of the institution, attracting a large number of men who are not active in other sports. Since it is our purpose to get as large a per cent of the student body to participate voluntarily, provision should be made for a man to devote at least his entire afternoon to this work. Hockey may be considered as a minor sport in the institution, but is very desirable, since it is one of the few outdoor sports of the winter season. The immediate coaching and directing of this sport has been in the hands of the senior students, since we have been unable, with the staff employed, to provide other direction and supervision.

It was thought, when Alumni Athletic Field was completed, that adequate space for outdoor athletics had been provided. However, the increase in participation which has taken place since its completion has been so great that during the fall and spring terms it is impossible to provide sufficient space for all the men who wish to participate. Tennis is a minor sport, but attracts a large number of men who are not attracted by other athletic sports. This institution should have at least twelve courts, whereas at the present time we have two very poor ones. Professor Hicks tells me that we should attempt immediately to extend our athletic field equipment to provide for at least twelve tennis courts and two additional football and baseball fields; the same grounds being used for both sports. If the hockey rink, which is at present under construction, works out satisfactorily, it will mean that the College pond can be left open for skating, and that the men who are participating in hockey will have a satisfactory equipment for their work.

This is probably the only educational institution of standing in the country which attempts to maintain a Department of Physical Education without providing a gymnasium wherein the department may follow up the development of men found

necessary after the physical examinations. We have maintained a Department of Physical Education for twelve years, and its real function has been the organization and supervision of outdoor games. In the beginning, with the number of students then in College, and with the existing condition of the drill hall, it was possible to carry on some gymnastic work. At present we have not even a satisfactory dressing room for those men who voluntarily take this work. The locker and shower rooms provided are actually unsanitary. To attempt to carry on the work of this department under present conditions is exasperating to all concerned. The greatest need is a new gymnasium building which may be utilized for both gymnasium and military work.

The development of coeducation in the institution has raised the problem of a place for recreation and gymnastic work for the women. For two years they were fairly well taken care of in a temporary gymnasium in the old chapel. However, this was taken away from them when the reading room was installed. Mrs. Hicks has been conducting required exercises for the women throughout each year, but at present the work has been reduced to the absolute minimum because there is no satisfactory place for carrying on the work. For outdoor work they have no field, and it is very discouraging to attempt to do anything for them with the facilities provided.

#### **Department of Military Science and Tactics.**

During the year the cavalry unit has replaced the infantry unit of the R. O. T. C. The Legislature of 1920 made an appropriation to provide a stable for the cavalry horses. In October an assignment of 36 horses and 2 mules, together with the necessary equipment, was made. In order to provide adequate care for the horses and instruction to the students the government detailed to the College a commissioned officer and 16 enlisted men. Maj. F. E. Snyder is now assisting Colonel Walker in the instruction work. It is apparent that the cavalry drill is more attractive to the students than the infantry drill, and it is expected that this new feature of military work will fully meet the expectations of Colonel Walker, who did much in obtaining the cavalry unit, and of the War Department.

**LEGISLATIVE BUDGET, 1921.****Current Maintenance.**

The request for current maintenance for the ensuing year totals \$995,000 gross appropriations from the State. This represents an increase of approximately \$260,000 over the appropriation granted in 1920. This increase includes the following items: to provide for salary increases, new positions and vacancies allowed during 1920, \$40,000; further salary increases proposed for 1921, \$20,000; to provide for new positions and vacancies in 1921, \$40,000; to meet the increased demands for skilled and unskilled labor, \$25,000; travel, office and other expenses, \$80,000; heat, light and power, \$30,000; repairs, \$18,000; control laws, \$7,000. A number of new positions are requested for instruction in the Short Courses, Extension Service and Experiment Station.

**For Permanent Improvement.**

*Chemistry Laboratory and Equipment, \$600,000.* — This is the second time that this structure has been asked for, and it has been under discussion for many years. The Commission on Investigation of Agricultural Education said: "An adequate chemistry laboratory is equally needed. The present chemistry building is one of the oldest, most dilapidated and most unsuitable buildings on the campus." Chemistry is a subject required of every student because it is fundamental in all agricultural work. For the same reason the research work in chemistry demands more space than does any other single branch of investigation. It is estimated that it will require an appropriation of \$600,000 to build and equip a building that will be at all adequate to meet the situation. However, not more than one-third of this amount will be needed during the present fiscal year.

*Improvements at Power Plant, \$76,000.* — The appropriation here requested is to provide for an ash storage bin and for two additional boilers and stokers for the power plant.

In order to meet the constantly increasing demand upon the steam boilers, to replace present boilers, some of which are eighteen years old, and to maintain a minimum reserve of

boiler capacity for use in case of emergency, our engineer considers it necessary to install two 406-horsepower boilers equipped with stokers. The cost of these items is estimated to be \$35,000. A stoker should be installed in connection with a 200-horsepower boiler already used. The necessary cost of setting these boilers, piping, flue work and other necessary repairs and improvements, incident to this installation, amounts to approximately \$69,000.

*Miscellaneous Improvements and Equipment, \$75,000.* — This item is composed of some 170 projects submitted by the various departments of the institution indicating department needs for improvements in buildings, for new equipment, for replacement of equipment and for the replacement of live stock. The aggregate cost of these projects would be \$133,000. Some of these projects have been deferred for many years, and all should, in justice to the institution, be provided for this year. We feel that \$75,000 is the minimum which should be expended this year for this purpose, and a reduction from the total requests by the departments has been authorized by the trustees, only in consideration of the various demands made upon the State treasury by this and other departments of the Commonwealth.

*Addition to Rural Engineering Building, \$30,000.* — An extension to the rural engineering shops is made necessary by the increased enrollment of students desiring instruction in this department. An especially large number of the two-year students are choosing this work, and the present facilities are inadequate. As was expected when the department was organized, it has developed into one of the most useful and popular of the practical departments, and there is really no limit to the service that it can render to the students and the farmers of the State. Farm machinery is becoming more and more an important factor in agriculture. Simply to meet the existing demand requires that the present space be doubled.

*Purchase of Brooks Farm, \$21,400.* — The erection of certain buildings on the campus during the past twenty years has made a serious encroachment on the field plots used by the Experiment Station. Immediately adjoining the College estate on the north is a farm, the soil of which is a continua-

tion of that now used for Experiment Station purposes. The area comprises 60 acres, and farm buildings. In a recent appraisal by three competent judges \$21,400 was agreed upon as a fair price for this property. This land is now very urgently needed for the purpose indicated, and, looking into the future, it seems absolutely essential that it be available for experimental purposes.

*Tennis Courts and Gymnasium for Women Students, \$13,500.*

— The gymnasium work for women students has been carried on for three years, and the number of women has been constantly increasing. We have been using the old chapel which has been a very satisfactory floor, but as this has now been assigned for the use of the library, it will be no longer available for the girls. The tennis courts should be permanent, and the building a wooden structure with board floor 40 by 60 feet, and 20 feet clearance ceiling, the building to be heated by furnace.

*Market-Garden Field Station, \$10,000.* — In 1919 the State Legislature, through special appropriation, provided \$7,500 for the construction of this building. The work has not been undertaken because it was evidently impossible to complete the project with the funds available when it was possible to start the work. Two revisions of plans were made to assist in reducing building costs, but cost of labor and of materials so increased that it seemed unwise to proceed. Consultation with market gardeners of the advisory board, the architect and builder all resulted in advice to wait until adequate provisions could be obtained for the building.

*Equipment for Tillson Farm, \$10,000.* — For a number of years the institution has been developing important research work in connection with poultry husbandry, and it is apparent that valuable results may be obtained by the continuation and expansion of these projects. It is desirable that this experimental work be done at an isolated place. The College owns a farm of about 70 acres located some distance from the main area, and it is proposed to develop this farm as an experimental poultry plant. It will be necessary to build laying houses, a breeding house, an incubator cellar, a feed room and a barn. Considerable fencing must also be done.

The total cost will be slightly in excess of \$10,000, but it is thought that this amount will be adequate for the initial work.

*Poultry Breeder and Judging Laboratory, \$8,000.* — During the past two years our poultry plant has been inadequate to meet the needs of the number of students enrolled in the various courses. It is scarcely large enough to take care of our juniors, seniors and Short Course students, while the freshman class, one-year vocational course and two-year course have more than tripled the requirements for laboratory facilities. This laboratory building will house 24 small pens and furnish a large laboratory 20 by 30 for general demonstrations, and a large long laboratory on the second floor to be used particularly for judging and culling.

*House for Farm Superintendent, \$8,000.* — In order to make the most economical arrangement relative to the employment of farm help it is necessary to insure at least reasonable living conditions for them. If the present house occupied by the farm superintendent could be converted into a boarding house for the farm help it would go far in solving the present difficult situation; \$8,000 is requested to provide a cottage which the farm superintendent would then occupy.

*Macadam Road, \$8,000.* — There is no first-class macadam road anywhere on the campus. There are two main approaches to the campus which have heavy traffic by sightseers as well as others. The total length of the main drives on the west campus is approximately one mile. All the coal used by the institution is brought in from the railroad stations, chiefly by automobile truck. That portion of the road which is used for this purpose should be macadamized at once. The distance is approximately 1,750 feet, and the estimated cost is \$8,000.



### THE COLLEGE AT THE CROSS ROADS.

An institution rarely follows a direct road to its objectives. It has its roadside delays, its bypaths, its hills of difficulty. Our College is no exception. In the long look backward we see great progress, but we discover also times of serious discouragement, even hours of crisis. There have been days of criticism, periods of starvation, moments when the very existence of the College was threatened. The College more than once in its history has found itself at the cross roads.

There is no doubt in the minds of those immediately responsible for the administration of the College that it faces another of these crises, perhaps the most significant in several decades. This conviction of a serious situation reveals itself chiefly in a deep feeling of uncertainty — a doubt not so much as to the course the College *should* take, but a real anxiety as to the course it is to be *permitted* to take, and the speed and effectiveness with which it may proceed. I freely grant the fact that uncertainty and anxiety characterize our time. Labor, industry, transportation, commerce, merchandizing, agriculture, religion are nearly rudderless as a result of the great world storm. Doubtless we are facing in America a period of rebuilding in education as in other human interests. The colleges share these large general problems of reconstruction. But the present crisis at the Massachusetts Agricultural College is not wholly a result of the war. It consists in certain pressing questions about policy, program and support that have been gathering force for some time, and now demand answers. The remainder of this report is an attempt to analyze a situation that should not be trifled with.

### The Necessity of Increased Salaries.

In my report of a year ago I indicated the outstanding importance of substantial increases in salaries for practically the entire staff. The increases secured by no means met the needs. The failure to pay our employees adequately is still a major problem.

A year ago I reported 39 changes in the staff. The past year there have been 58 changes, — 30 in the professional staff and 28 in the clerical staff. In three important departments the personnel has almost completely changed within the past year. Nearly 100 changes in a staff of approximately

200 persons have occurred in two years. Less than one-third of the Extension staff employed two years ago are now with us. In these two years there have been 43 resignations in the clerical staff which ranges in number from 50 to 60.

I do not wish to be misunderstood with reference to the reasons for nor the significance of these changes in staff. The turnover in all business has recently been unusual. Moreover, commercial business has increasingly been made attractive to men with an agricultural training, as it has been to many other groups of college men. No college can retain all the men it would like to keep. With due allowance for these factors, the situation still remains acute. It takes considerable time for the new employee to begin to do his best work, in the Extension Service particularly. It is estimated that it takes new clerks at least four months to become really effective. Nor will it do to imply that these changes in the clerical staff are of minor consequence — quite the opposite is true. A very small proportion of our clerical service is of a strictly business character; it is almost wholly professional. It needs clerks of good education and of high intelligence. They cannot easily be transferred from one department to another. Each department has its own vocabulary; its own technical procedure. In the majority of the clerical positions the clerk is required to be in some real sense a specialist, so that when a well-trained clerk of this type leaves, the professor for whom she has been working is handicapped in both time and in energy. His main work is seriously interfered with.

Our budget last year called for an increase in salaries for the positions held by the professional staff averaging about 16 per cent. The Legislature granted a sufficient item in the appropriation bill to cover this amount, but the allowances made by the Supervisor gave us an average of only about 12 per cent. These increases at first blush may seem to be reasonably satisfactory. Of the increases recommended by the trustees, those for about one-half the staff were allowed or minor reductions made in them. However, the increases for nearly one-half the staff were materially reduced, individual cuts ranging from \$120 to \$300, and in some cases considerably more than this. The average cut in the salaries the trustees asked for this group was 34 per cent.

*Salaries of Administrative and Professional Staff.*

RANK.	Number.	Average Salary, 1914.	Average Salary, 1920.	Per Cent Increase granted, 1920.	Per Cent Increase over 1914.	Proposed Average Salary, 1921.	Normal Average, 1921. <sup>1</sup>	Per Cent Increase requested, 1921.	Per Cent Increase, 1921 over 1914.
Dean and directors, . . . . .	5	\$3,833	\$4,580	7.2	19	\$4,936	\$5,750	7.7	29
Professors: —									
Heads of departments, including heads of divisions, .	24	2,625	3,440	14.4	31	3,764	4,200	9.4	43
Not heads of departments, . . . . .	25	2,175	3,003	12.0	33	3,251	3,500	8.2	49
Assistant professors, . . . . .	32	1,734	2,358	16.0	36	2,660	2,750	12.8	53
Instructors, . . . . .	28	1,137	1,696	12.9	49	1,861	—	9.8	64
Total, . . . . .	114	—	—	—	38	—	—	—	52
President and others on administrative and professional staff.	19	—	\$2,997	8.9	—	\$3,249	—	8.4	—
Total staff, . . . . .	133	—	\$2,710	12.5	—	\$2,972	—	9.7	—

<sup>1</sup> Salary considered fairly adequate under present conditions.

I am presenting tables which show that the average salaries now being paid in all grades of the professional staff are only 38 per cent greater than were paid in these same grades in 1914, and that, if our estimates for 1921 salaries should be granted, the total percentage of increases in seven years will be only 52 per cent. This is scarcely more than one-half of the increase in the cost of living for the period, for, according to figures prepared by the Commission on Necessaries of Life, the increase in living costs amounts to approximately 100 per cent. We must remember, further, that in a college in which a majority of its staff are relatively young men, an average increase of 5 per cent a year for the entire staff is not excessive, merely in recognition of increased value of service and quite apart from any increase in cost of living. But it will be seen that our staff have suffered *a serious progressive reduction of actual salary income for the past seven years.*

Meantime, the other leading agricultural colleges of the country have met the situation. I submit a table which shows that while average increases in salaries in several agricultural colleges of the country were over 30 per cent from 1918 to 1920, our own were only 15 per cent. These same colleges, with one exception, are proposing further increases, varying all the way from 6 to 35 per cent for next year, while we are proposing an increase of 10 per cent.

*Salary Increases in Various Institutions.*

	Per Cent Increase made, 1918-20.	Per Cent Increase proposed, 1921.	Per Cent Total, 1918-21.
Kansas State Agricultural College, . .	27	30	65
Michigan Agricultural College, . . .	60-100	None.	60-100
Iowa State College, . . . . .	20	35	62
University of Wisconsin College of Agriculture.	52	6	60
Ohio State University College of Agriculture.	58 per cent in average salary in various grades.	No further increase in standard salaries.	58
University of Missouri College of Agriculture.	20	38 per cent in maximum salary in various grades.	-
Cornell, College of Agriculture, . . .	17-44	11-29	-
University of Illinois College of Agriculture.	33 per cent for lower paid groups.	33 per cent for those not previously increased.	-
Pennsylvania State College, . . . .	30	10	43
New Hampshire State College, . . .	20	10	32
Connecticut Agricultural College, . .	25	Substantial.	-
Massachusetts Agricultural College, .	15	10	26

We have also made an inquiry as to how this institution ranks in the matter of payment to heads of several typical college departments, and we observe not only that we are near or at the bottom of the list in every case, but that the amount of salary in these other institutions in some cases is far higher than ours. In Ohio, for example, the present salaries for department heads range from \$3,500 to \$6,000. Or, again, in the Michigan Agricultural College the minimum salary for heads of departments is \$4,500. We have twenty-seven heads. Three of these serve also as deans or directors, and receive salaries ranging from \$3,900 to \$4,800; three others are heads of divisions as well as heads of departments, and are receiving salaries of \$4,000 or \$4,200. Of the twenty-one heads of departments who have no unusual administrative responsibility two are paid \$3,900, and the other nineteen receive salaries ranging from \$2,340 to \$3,720.

Nor is it unfair to compare our salaries with those in some of the liberal arts colleges and endowed universities. In Amherst College the minimum salary for the full professor is \$4,500, at least 50 per cent more than our own minimum. Another element in this comparison is the fact that in most colleges members of the teaching faculty have three months in the summer for vacation, for professional improvement, or for further earnings. At present probably more than three-fourths of the members of our professional staff work eleven months in the year.

I reported a year ago that the salaries of our staff had been standardized, with minimum and maximum salaries and definite increments of increase for each grade. It was our supposition that this scheme of grades would be largely automatic. Unfortunately this plan seems not to have been followed in actual operation. It is exceedingly important that members of the staff know about what to expect in the way of increments of salary increases from year to year, so long as their service is satisfactory. In fact, an element in this whole salary situation quite as serious as the failure to actually increase salaries is the uncertainty as to the future.

We can fairly argue for increase of salaries to members of our staff purely on the basis of justice to them. But as a

practical business proposition, also, we should make increases. The institutions which have made the most liberal advances in salaries are our active competitors for the type of men that we have on our faculty. There is a scarcity of well-trained men for these positions. Some of us believe that the difficulty of the agricultural problems in New England makes it all the more necessary to have the very best men obtainable to serve as experts in the various departments of the institution. We cannot get them and keep them for any length of time unless we are willing to pay reasonable salaries. Do I need to reiterate that a college consists in its men? Governor Coolidge recently made the statement in public that "it is useless to send boys to college to be educated by an underpaid faculty." Is Massachusetts willing to follow a practice which inevitably will lower the quality of our personnel? Does Massachusetts wish deliberately to plan for a second-grade or a third-grade college in this great sisterhood of land-grant institutions? That issue is with us now.

#### **Administrative Control.**

By virtue of chapter 262 of the General Acts of 1918, the College became a State institution in a technical sense, and thus apparently subject to all laws and administrative rules governing the entire group of State departments and institutions. These requirements have been made known to us through a long series of rulings, oral and written, coming from time to time from the State Auditor, the Supervisor of Administration, or the Commissioner of Education.

Some of these rules relate only to details and do not affect the College seriously. Some of them require practice that we think less effective than our former methods. Some of them are in our judgment decidedly detrimental to the best work of the institution. In fact, the whole procedure is becoming increasingly burdensome and unsatisfactory. Let me indicate a few of the main difficulties.

On account of the new regulations the work in the treasurer's office has vastly increased; additional clerks have been taken on wholly on that account. Owing to the necessity of sending all bills to the State House, both payments and statements of

accounts are delayed. The monthly statements, formerly in the hands of the administrative officers the middle of the month, now come out two months later, and are practically valueless for current business purposes. I am, indeed, prepared to recommend that some steps be taken to develop an entirely new method of accounting for the benefit of administrative officers, either by allowing them to keep their own accounts, or by a system of budget accounting. The details that must be followed in making purchases cause delay, and it is very doubtful whether better prices are obtained than we could ourselves secure. The requirement that all our printing shall be done by the State printers, as accommodating as those printers are, leaves much to be desired in the way of promptness in publishing material that is of value only as it has quick circulation.

The requirement that all income earned by the institution shall go into the State treasury, instead of as formerly constituting a circulating fund, tends to lower the business efficiency of our producing departments. The fact that we are theoretically supposed to get credit for this income does not dispose of the question at all.

In any college it is necessary to seek men for new positions during the winter or early spring. This past year we were unable to make offers to candidates for new positions or for vacancies until the college year was practically over, and in the case of graduate assistants not until midsummer. In our Extension work particularly we find need to make quick decisions with reference to personnel, but we cannot act on our own decision. We cannot take on any employee, permanent to temporary, nor increase a salary, nor change a grade without permission. Our judgment as to the adjustment of salaries as between different persons may or may not be followed. We cannot even determine our own educational policy; if a choice is necessary between two new positions desired, our opinion concerning the greater need is not final.

Chapter 350 of the General Acts of 1919 states that: "The trustees of the Massachusetts Agricultural College, existing under authority of chapter two hundred and sixty-two of the General Acts of nineteen hundred and eighteen, are hereby

placed in and shall hereafter serve in the said department" (Department of Education).

Thus the responsibility for the control of the institution has passed out of the hands of the trustees and the administrative officers chosen by them. The College has come under a government by laws and administrative rulings devised for ordinary administrative departments of government or for institutions of a charitable or penal character — laws and rulings never intended for an educational institution, and certainly not adapted to a college such as this.

Moreover, the question is never asked us, will this new rule make the institution more or less efficient? We are simply required to conform. Standardization of personnel, centralized administrative control, the routine methods of a highly organized bureau are substituted for the judgment of those closest to the work, their full responsibility for results, their specialized experience, and their pride in achievement.

I recognize that we at the College may be prejudiced because some of our old freedom of initiative has been taken away. I have endeavored to discount this. I also want to make it clear that we are not complaining of the attitude or activities of State officials. There is every reason to think that they are simply carrying out the law as they understand it. But I cannot state too strongly a growing conviction that the system as applied to our College is wasteful, unscientific and unworkable.

We do not ask to be released from close financial oversight. We do not wish to be outside of the budget system. We have no desire to break away from the general educational system of the State. We ask that Massachusetts recognize, as other States have recognized, that there is a difference between the College and other State institutions, both with respect to the financial and the administrative control. We ask, also, if it is not possible for this State to give back to the trustees the management of the institution, while at the same time providing all necessary checks upon our activities and methods? Responsibility and initiative on the part of the trustees and other employed officials are absolutely essential to the effective management of the institution.



### **The Scope of the College.**

In my report for the year 1911 I emphasized the proposition that this is an agricultural college and nothing but an agricultural college. The policy of the College for all these years has been in harmony with that declaration. We have stood steadfast against any departure from this fundamental basis of our work. During the past fifteen years the proportion of our graduates going into agricultural pursuits has shown a decided increase over former years.

We have, however, been obliged constantly to broaden our definition of agriculture and to widen the scope of our activities. In my report of 1918 I called attention to the fact that the developments of the war had demonstrated that we must deal with the whole question of the food supply of the people of the State; that it was not enough in our investigations and our teaching and our Extension Service to consider only the production of farm crops and animals; but that we must prepare to deal with questions of food distribution, of food conservation, and even of food use in the home. In this connection may I call attention to the fact that, particularly in our Extension Service, the Federal government is committed to the idea that the land grant college shall develop work in home economics. Yet thus far we have been unable to secure an allotment out of our State appropriation sufficient to give the same support to our county home demonstration work that we are able to give in the case of farm work.

Thus, while the interests and needs of Massachusetts farmers are our first concern, it is also our obligation to place ourselves at the disposal of the entire population of the State, in city and in country, with respect to all these problems of food supply. I am sure I do not need to indicate the obvious significance of this newer definition of our work. It opens up an unworked range of possibilities, and requires us to render an account of our stewardship to all groups of our people alike, — to farmers, to workingmen, to business men, to the entire population of the Commonwealth.

### **The Administrative Policy and Organization.**

Some years ago I presented a somewhat detailed outline of various aspects of policy and organization that I thought should be developed, or at least should be studied. Through the years some progress has been made. It is slow work at best, and the war practically put a stop to any serious study of these questions. We have, however, outlined a plan for securing the co-operation of several groups of persons interested in the College, including faculty, students and alumni, as well as representatives of agencies not immediately connected with the College, in an effort to see if at the forthcoming semi-centennial there may not be presented a clear outline of our problems and how they may be met. I have invited a representative of the United States Bureau of Education, who has consented to work with the Land Grant College Association in these matters, to make a personal study of our administrative organization, and to report his findings and suggestions. We already have on file a report from a first-class efficiency engineer, made after a pretty careful study of the form and method of our business organization. Perhaps the most difficult, and without doubt the most important, of these problems has to do with the course of study; not merely because the course of study must reflect the scope and policy of the institution, but because courses offered, methods of instruction, relationships between vocational, citizenship and cultural aspects of education are all of the utmost consequence in the training of future leaders.

### **The Permanent Building Program.**

For many years I have annually been obliged to stress the fact that we were far behind in our building program. To-day the situation has become not only extremely discouraging but almost disheartening. No major building has been provided in seven years. Departments inadequately housed a dozen years ago are still obliged to put up with the same facilities they had then. New departments have no abiding place. The increased costs of building have only added to our difficulties. You will recall that I laid this whole situation before you last autumn, and, acting under your direction at that time, I have

prepared a building program which I believed to be a minimum program for the next ten years. The architect will submit provisional plans for all of these buildings with estimates of cost.

In this connection I mention again the need of a *permanent* building program and financial support for it. Here, too, the element of uncertainty is a prime difficulty. A regular annual apportionment item in the budget, either a fixed sum or a sum the amount of which is designated by a so-called mill tax, or some other method of permanent and regular adequate appropriations for buildings and other permanent needs is another of the crucial needs of the institution.

### **Public Understanding and Support.**

The extent of the service of a State-supported institution is governed very largely by the extent to which the people of the State know the facilities it offers for the education of their children and the solution of their problems. I am amazed from time to time to discover evidences of the slight degree to which the people of the Commonwealth know the College and its work, to say nothing of its possibilities of usefulness to them. It is perhaps not surprising that a Legislature should question a budget so large as ours, unless the people recognize the work the College is doing and capable of doing. I have repeatedly urged larger appropriations for a sane, fair, but aggressive plan of publicity for the work of the College. I am now convinced that this is one of our great needs. Let me make it clear that it is not a matter of advertising for more students, much less a matter of self-praise. It is simply the necessity of laying before our constituents, that is, the people of the entire State, information as to how we are trying to serve them, and of seeking from them counsel as to how we can serve them better. You will remember that last autumn you authorized me to present to you a plan by which the purpose, work and needs of the institution could be more fully laid before the people of the Commonwealth. I have prepared an outline of such a plan.

## WILL THE STATE SUPPORT THE COLLEGE?

For thirty years after the College received students it had extremely meager financial support, even for those days. The average annual income from the State for current maintenance from 1867 to 1896 was \$13,333, and the average annual appropriation for land, buildings and other equipment for the same period was \$12,990. By the close of the century the tide turned. In 1898 the Legislature appropriated \$28,000 for the erection of a veterinary laboratory, *the first teaching building of permanent construction erected on the campus*, and since that time substantial modern buildings have from time to time been added. Beginning a few years later, the annual appropriations for current maintenance were progressively increased. The physical "plant" of the institution is now inventoried at nearly \$2,000,000. For the fiscal year just closed the total net cost of the College to the State for current maintenance was about \$600,000. Our responsibility for the wise use of these large grants is very real; our staff as well as your Board of Trustees are fully conscious of this trust.

However, we must ask the people of the Commonwealth not to blind their eyes to the rapid and wide expansion of effort and the vastly broadened scope of service which has resulted from the use of these large sums. Nor should the State fail to sense the new opportunities which the College continually faces. The main question to be now put, is not the expense of the College to the State, but how far is the State warranted in making appropriations sufficient to permit the College to cultivate these wide untilled fields of opportunity. Theoretically there is scarcely a limit to the service the College can render. Practically, the Commonwealth will set bounds; the College cannot expect to secure all the funds it could wisely use. The real question, therefore, I repeat, is how far the State is willing to go, — how much faith does it have in the results of the investments in the College? We ought to know what support to expect.

I wish it were possible for the Legislature to realize that we are not pressing for added salaries, or for increased mainte-

nance, or for new buildings with any other reason than that in our judgment these appropriations are absolutely essential in order that the College shall render its full service to the sons and daughters of Massachusetts, and, indeed, to the entire population of the Commonwealth. Furthermore, can we not all agree that the institution, if it does its work well, is an investment, an asset not a liability; that it really results in adding to the wealth of the State and not subtracting from it? Is our College to be regarded as a necessary nuisance, or as an object of the most liberal possible support because it is considered indispensable to the economic and social progress of the State?

Can I possibly be more clear or emphatic in stating that this institution is not *our* institution? It does not belong to the trustees nor to the faculty; it belongs to the people of the State. We are their trustees for its effectiveness. We simply report the conditions under which it can be made fully effective. We would be derelict in our duty if we failed to indicate the terms, either financial or administrative, under which we believe it can be made most effective.

### **In Conclusion.**

The College is at the cross roads. These various problems of salaries, of administrative control, of the scope of the institution, of its organization and methods of work, of supplying it with adequate physical equipment, of getting into touch with the people to whom we are responsible, — all of these are elements in a real crisis. I am aware that any institution constantly faces new problems, and that it takes time as well as patience and thought to bring such issues to a satisfactory conclusion. But these questions that I have raised are things that cannot wait for answer if the College is to be fully effective. We are losing ground, gentlemen. We cannot maintain the old *esprit de corps*, the vigorous and aggressive spirit that I think it fairly may be said has characterized our methods and our outlook, if the present uncertainty continues long. I plead, then, for such action on your part and on the part

of the Legislature and the State officials as shall enable us, if not to achieve all the ends that we would like to accomplish in the immediate future, at least to have a fuller knowledge of what is to be expected of us and of the extent to which we are to be supported in such service as we are called upon to do.

KENYON L. BUTTERFIELD,

*President.*

## REPORTS OF OTHER ADMINISTRATIVE OFFICERS.

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**Report of the Dean.**

During the year 1919-20 the dean's office was able to try the system of faculty-scholarship advisors with the freshman class in a more intensive way than ever before. This was due to the comparatively small freshman class, which relieved some of our freshman instructors from the usual heavy burden of classroom work. In previous reports I have mentioned the great need of helping the new men to make the transition from high school to college, and the need of a corps of kindly teachers to handle this problem. Professors Machmer and Parker gave a total of time greater than was ever given before by appointed advisors, and I am glad to say their efforts proved most effective. We had a fewer number of men dropped from College and fewer "low" and "below" students on the midterm reports than in any year since I have been in charge of the records. This record confirms my belief in the advisability of giving close personal attention to the first-year student during the first months of his residence.

In the future I trust we may be able to increase this supervision. I refer, of course, only to the important months of the first terms. It should not continue, except in a few individual cases, beyond the second term of the freshman year. In order to do this, however, we must either engage one or two special men to give all their time to it, or else employ additional instructors to help relieve the heavy burden of our present staff of freshman teachers.

This report is written at the end of six weeks of the fall term 1920-21, during which time we have not been able to give the freshman the attention we gave him last year. The result, I am sorry to say, is a rather low average of scholarship, and the midterm report is most unsatisfactory. Of course, other factors, like fraternity rushing and other social dis-

tractions, have contributed to this unfortunate result. I am quite sure, however, that if our instructors had been able to give as much time and attention as was given last year the story would be quite different.

The question of thorough and continuous work is ever with us, and I do not suppose we can ever hope to solve it entirely. The despair of all teachers is the happy willingness of the pupil to do just a passing grade of work; in view of it the teacher is bound to demand a high grade of work in his own classroom, and to inspire the student by precept and example to do his best at all times. Most of our instructors do make such demands, especially in the first two years. On the other hand, we have our easier courses, and a student often chooses a large program which fails to challenge not only his best effort but any real hard effort at all. The remedy, of course, is mainly in the hands of those who have charge of formulating and welding together the courses of the curriculum.

I have intimated above the deleterious effect upon scholarship of such matters as "fraternity rushing." I feel called upon to say very positively that our system this year (allowing "rushing" to continue for the first two weeks of college) was most disastrous to the scholarship of the two lower classes. The same conditions should not be tolerated a moment another year. Members of each class have freely made personal confession that it was demoralizing and disruptive to a degree they had never experienced before. Since many students and alumni are agreed that a different scheme of fraternity pledging should be substituted, we may hope this year's experience will not have to be repeated.

Last year Professors Machmer and Parker tried to keep a record of the freshmen in respect to previous training and scholarship difficulties. They also collected a great many other data in regard to individual students. I have no doubt that this information proved helpful in more ways than one in the handling of the individual. Of course it takes time and necessitates some clerical help. This year Professor Parker has assumed the work of Professor Sprague who is absent on leave, and Professor Machmer has come into my office as assistant dean. These men, therefore, can only do a



small part of the work which they did last year, and the other advisors are too busy to give this important matter any more time and attention than they did last year. I mention this matter simply to emphasize the need of extra help if the advising is to be done with thoroughness.

During the past year the faculty has superseded the old unclassified student arrangement by a new one called "special." It was felt that those who used to enter our "unclassified" group were now well served by the two-year short course, and that therefore we could dispense with it. The faculty, however, realized that there were certain types of experts who might be able to profit by our work who could not be served either by the regular course or by the two-year short course. It was ruled, therefore, that applicants for work in certain departments, whatever their previous technical schooling had been, could appeal to the heads of those departments to be allowed to do special work. If the head of the department is satisfied that the applicant has revealed special skill, or has had a satisfactory practical experience he is to recommend to the president that the applicant be admitted to take such work as may be planned by him either in the short course or the regular course, or in a combination of both. This group is called the special group.

This special student group makes the fourth or fifth distinct group in College at the present time, and the campus presents a larger diversity of groups and grades of students than ever before. This situation presents real problems for those who want to see a harmonious and happy college body. No class of persons in the world is more jealous of prerogative and tradition than the typical four-year student. Some of the men in the other groups, on the other hand, are unable to appreciate this undergraduate point of view. There is therefore a possibility of real friction in the present situation. I am glad to say, however, that thus far we have managed to live together without dissension or misunderstanding. Those who have been in charge of student affairs have handled the dangerous points with extremely good judgment and much wisdom. We are hoping that nothing will happen to spoil the excellent relations of the different groups, and to see them

crystallize into a relationship that will continue to promote good feeling and good will.

I should not close this report without a sincere expression of appreciation for the fine service rendered in the dean's office by Prof. Charles H. Patterson during the past two years. As acting dean he was most faithful and efficient in respect to countless details, and most gentlemanly and courteous in his relationships with the students.

EDWARD M. LEWIS,  
*Dean.*

### **Report of the Director of the Experiment Station.**

The greatest present problem before the Experiment Station is that of selection of fields of work. Shall the Experiment Station attempt to cover the whole field of agricultural research, or shall it endeavor to concentrate on a relatively few major problems, and devote all of its energies to their solution? This is a matter of institutional policy, and one which should be thoroughly studied before any radical changes are made in the existing order of things. Especially is it important that all suggestions for new lines of work be scrutinized with reference to their effect on the older lines, and to the possibility of the Experiment Station being able to command sufficient resources to support both classes of activities on a comprehensive basis.

As an aid in this suggested study, I am submitting herewith a statement showing the number of research projects now under way at the Experiment Station, classified primarily in relationship to the food problem of Massachusetts and of New England. It should be understood, however, that the number of projects at hand on a given subject is only a rough indication of the character and importance of the work being done.

DEPARTMENT.	EXPERIMENT STATION PROJECTS AS RELATED TO THE FOOD PROBLEM.											Totals by Departments.		
	PRODUCTION.								CONSERVATION.					
	PLANTS.				ANIMALS.				Basic Investigations.	Preservation Practice.	Distribution.		Miscellaneous.	
	Nutrition.	Adaptation, Ecology, Physiology.	Culture.	Protection.	Nutrition.	Physiology.	Protection.	Miscellaneous.						
Agricultural economics, .	-	-	-	-	-	-	-	-	-	-	4	-	2	6
Agriculture, . . . .	12	1	-	-	-	-	-	-	-	-	-	-	-	13
Botany, . . . .	1	1	-	6	-	-	-	-	-	-	-	-	4	12
Cranberry station, .	-	-	3	3	-	-	-	-	-	-	-	1	-	7
Entomology, . . . .	-	-	-	12	-	-	-	-	-	-	-	1	-	13
Horticultural manufac- tures.	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Horticulture, . . . .	-	8	3	1	-	-	-	-	-	-	-	1	-	13
Market-Garden Field Station.	2	2	2	2	-	-	-	-	-	-	-	-	-	8
Meteorology, . . . .	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Microbiology, . . . .	1	-	-	-	-	-	-	-	10	-	-	-	1	12
Plant and animal chem- istry.	3	1	-	2	6	-	-	-	-	-	-	-	-	12
Poultry husbandry, .	-	-	-	-	-	2	1	1	-	-	-	-	-	4
Veterinary science, .	-	-	-	-	-	-	6	-	-	-	-	-	-	6
Totals, . . . .	19	13	8	26	6	2	7	1	10	1	4	4	7	108

It will be noted that the mass of our station activities represent studies of problems of production. To a much lesser degree, and only recently, have problems of conservation and preservation been given attention in a thoroughgoing and comprehensive way. Even less attention has been given to problems of distribution and marketing, at date of writing six only out of one hundred, eight projects being devoted to this branch of agricultural research. Finally, the human or social problems of the countryside are receiving no attention.

Even if it be granted that all work actually under way is adequately covering the field indicated, it is still evident that the Experiment Station is at present unable to cover adequately the whole field of agricultural research. This fact becomes even more evident when the status of work actually under way is investigated. On account of shortage of land, the Department of Agriculture has given up several important

lines of work, and in other ways curtailed its activities. For the same reason investigations on tobacco soil sickness as carried on by the Department of Botany have been so severely handicapped as to seriously reduce their efficiency. On account of shortage in personnel, the Department of Entomology has been unable to follow up several lines of work started by Mr. Vinal and incomplete at the time of his death. Similarly the Department of Botany has been unable to give full service in the investigation of certain fruit diseases, even though the fruit growers of the State have been insistent in their demands for this class of work. These serve but as illustrations, but they indicate the necessity for most careful study of the whole body of station activities. This problem is now being studied by a committee from the Experiment Station staff, and report will be made in due course.

#### THE NEED OF ADDITIONAL LAND.

Apart from the question of institutional policy regarding the initiation of new lines of work, there is, as indicated above, immediate need for more land to be available for experimental purposes. It is certainly an anomaly that an agricultural experiment station should be handicapped by a shortage of land. Such, however, is the fact. The encroachment of buildings is primarily responsible for this state of affairs. Draper Hall, Flint Laboratory, the Poultry Plant, Stockbridge Hall, the Rural Engineering Shops, and, more lately the Abigail Adams House, — all these have contributed towards diminishing the area of land available for Experiment Station uses, and likewise through unavoidable trespass decreasing the value of land remaining. I feel that under the conditions the Experiment Station has given a wonderfully good account of itself, but there is grave danger that unless these conditions can be remedied the work will more and more be carried on in an impractical way and on a laboratory basis. It will be lacking in the vitality which comes from close touch with the problems of the land, and to this extent will be unable to render full service to the farmers of the State. Therefore I must urge that this matter be given prompt consideration.

## ADDITIONS TO THE EXPERIMENT STATION STAFF.

In order that the Experiment Station may better carry on existing lines of work there is need of additional assistants in a number of departments. Assistant research professors are needed in the Departments of Botany, Horticultural Manufactures, Pomology and Microbiology. In each of these departments the mass of work which has developed, largely through the greater understanding on the part of the people of the State of the service rendered by the Experiment Station, makes such additional assistants imperative. Other assistants are needed in the administration office, at the Market-Garden Field Station, and in the Department of Veterinary Science; while additional graduate assistants can be used to splendid advantage in the Departments of Agricultural Economics, Pomology and Microbiology.

All of the above are needed to give full service on accepted projects now carried on our lists. Other positions which should be considered in the near future, but which contemplate increasing the scope of station activities, are those of research professor of farm management, and research professor of rural sociology, respectively, in the Departments of Farm Management and Rural Sociology.

## PROJECT ORGANIZATION.

Within the past year a definite attempt has been made to place all of the Experiment Station work on a definitely outlined project basis. This change was instituted by Prof. F. W. Morse, formerly acting director, and much progress was made previous to my undertaking the responsibilities of the director's office. With this work nearing completion it becomes apparent that a thoroughgoing study and reclassification should be made of existing Experiment Station projects, and that in the future all new projects should be so outlined as to secure the co-operation of all departments concerned. In order that this may be done, committees have been appointed from the different departments in the Experiment Station to give this matter attention, and to report back to the station staff in the very near future. It is hoped that this procedure will result in a better organization of our research forces.

### THE CONTROL SERVICE.

The work of the chemical control service has been carried along the same efficient lines as in past years. To the labor involved in the annual fertilizer and feed inspection, and in the inspection of dairy glassware and apparatus, has been added that of the enforcement of the poultry disease elimination law. It is too early yet to make full report as to the results, but the demand for this service, evident at the beginning of the second year, indicates that it should be continued, if possible, on a more thoroughgoing basis than during the past season.

### ACKNOWLEDGMENT.

In conclusion I wish to acknowledge the hearty and loyal co-operation accorded me by the different members of the Experiment Station staff. I believe that the time which is usually lost in changing any administrative organization will be somewhat decreased through the services thus freely given. Particularly I wish to express my appreciation of the co-operation given me by Dr. William P. Brooks, formerly director of the station and now consulting agriculturist; Prof. F. W. Morse, formerly acting director; and Dr. J. B. Lindsey, vice-director of the station. All of these men have spared no pains in placing at my disposal all information needed in prosecuting the work.

SIDNEY B. HASKELL,

*Director.*

### **Report of the Director of the Extension Service.**

The most outstanding fact in the Extension Service during the year 1920 has been the number of resignations. At the beginning of the fiscal year six vacancies existed in the professional staff. But two of these vacancies are filled at the present writing. Since Dec. 1, 1919, the following have resigned: Laura Gifford, assistant State leader of home demonstration agents; John D. Zink, supervisor of exhibits and Extension schools; Delos L. James, Extension specialist in dairying; L. Wayne Army, Extension editor; Roy B. Cooley,

Extension specialist in animal husbandry; Henry E. Haslett, Extension specialist in sheep husbandry; Earl Jones, Extension specialist in soils and crops; and Helen M. Norris, assistant State leader of Junior Extension. During the year 33 clerks have been hired in order to keep 11 positions filled, and at present there are two vacancies. But two of the present staff of clerks were on the pay roll a year ago. Further evidence of the inability to fill positions at the salaries allowed may be found in the unexpended balance of \$5,600 in the salary account.

The one principal reason for this crippling overturn in personnel is the inability to pay as much for equal grade of work as is being paid by institutions of similar type in other States, and by private business. Connecticut, New York, Ohio and Indiana have outbid Massachusetts by several hundred dollars for each type of work. The average salary gain to those specialists who left the service during the year was in the neighborhood of \$900 each. Others have stayed at a fearful sacrifice through loyalty to the responsibilities that they have assumed, and a hope that a fair measure of justice will be done them in subsequent salary readjustments. The statistics of overturn in clerical staff are the only necessary comment on our inability to hold adequate clerical help at the prices which we have been paying. When it is remembered that it takes a well-qualified Extension man a year to make his contacts and pick up the threads of work throughout the State, the loss in continuity of work accomplished, and in the money cost to the State of training a new staff of specialists, may be appreciated. The same is true in a fair degree of the clerical staff; much technical matter is included in the work of every day, and it is of great importance that the clerk who assists each specialist be familiar with both subject-matter and personnel throughout the State with which the specialist deals. During the past year a staggering total of time and effort have been required by new specialists in starting work, and by all specialists in training clerks who have afterward left for more lucrative work. While a number of changes have come in the county staffs, the vacancies have been filled quickly, as the Trustees for County Aid to Agri-

culture have been able to offer salaries sufficient to attract capable men and women.

The demonstration project work of the Extension forces has been remarkably well maintained in view of the foregoing handicaps. A fair continuity in the county staffs and increasing numbers of farmers co-operating in the demonstrations made this possible.

The best practices in agriculture and home-making, which it is the task of the Extension forces to promote, are already being followed by individuals. Those farmers and home-makers who are successfully following them are the best teachers of others. It is on this basis that Extension work is growing. The specialist and county agent strengthen the practice of the co-operating demonstrator; if necessary, train the demonstrator to tell how he or she does the work; and organize the attention of the community to the demonstration. In this manner the demonstrator and the demonstration are always available, and the agent and specialist have reached scores instead of individuals. These continuing demonstrations also do much to bridge the gaps in work caused by vacancies on the staff, as good farmers who have once accepted good practice usually continue to follow it, and to spread the teaching. Few changes in project activities have been made during the year, and a separate detailed report will be made on each of these as soon as the statistics of the county work are complete.

Casual work presents a serious problem. Many inquiries are received daily from individuals, and these are given personal attention, not only by Extension specialists, but also, if necessary, by the resident teaching faculty. Such work must always be done. We also have met most of the calls for casual lectures, and have been able to relate a larger number than ever before to demonstration work. The lecture that is not so related is usually unproductive of any permanent good. The people who ask such lecture service are quite ready to see the value of continuing demonstration work, and by relating such effort to the county agent projects much gain has been made in comparison with former years.

To assist in meeting individual inquiries, and to aid in all



Extension teaching, the staff has worked out a plan for a basic literature of Extension work, and is also revising and bringing up to date the various correspondence courses. With these new aids we are in better position to meet the demands of the hundreds of thousands of suburbanites and village dwellers who have good right to expect of the College assistance in their matters of horticulture, food preservation, poultry keeping and home-making.

Relations with both the United States Department of Agriculture and county agents have been most cordial. The constructive suggestions of both have been the basis of some changes in policy and procedure. On the other hand, we find a great readiness on the part of the county staff to accept suggestions on subject-matter and on methods of demonstration.

Looking forward to the new year our principal need is for men and women of experience and capacity who can take up the work interrupted by resignations, and who can be sufficiently supported to enable their continuance with us for more than a brief time.

JOHN D. WILLARD,  
*Director.*

### **Report of the Director of the Graduate School.**

The time has arrived when it is desirable to present as briefly as possible a comprehensive yet concise survey of the Graduate School, that its purposes, its articulation with the College, its methods and its functions may be understood.

#### **PURPOSES OF THE GRADUATE SCHOOL.**

Agriculture is so big, so vast, that its values and its significance are unappreciated and even lost to the ignorant mind which does not know what it is; to the restricted mind, even though operating within the field of agriculture, which lives upon itself and within its own encasement; and to the keen and broad minds engaged in other provinces of thought. Its practical, scientific, commercial and social bearings are so intimately bound up with the physical welfare, therefore, the mental and social welfare, of every individual and nation, that to neglect any part of its study and development means

disaster to society. It is one of the essential elements without which no nation can succeed or grow.

There is reason for this peculiar situation regarding agriculture. The man who raises a good crop of corn in accordance with recognized practices thinks he knows agriculture; the man who handles the products on the markets will tell all about agriculture; the man who studies the underlying problems of soils and plants will set forth the facts of agriculture; and even the man who sits on the fence smoking his pipe, while the weeds grow, is a typical *exposé* of agricultural practices. Surprising, but it seems true, the one type condemns the other as theoretical, impracticable, unnecessary. In a way agriculture is familiar to everybody, yet it is probably the least understood vocation. Perhaps no field of activity lacks so conspicuously in unity to build up a profession, a task, and to circumscribe its content. Is it not lamentable that any one engaged in agricultural pursuits should minimize any other aspect of agriculture that he may foster his own and antagonize the general good of agriculture as a whole? He exploits only his own ignorance of the profession of which he is a part; he dishonors and degrades the most noble vocation given of God.

To understand agriculture in more specific terms, to comprehend the underlying principles of agriculture which serve as a directive and imperceptible guide, to grasp the operations of agriculture in its relations with commerce and the feeding of populations of the world, lead immediately to the most profound depths of learning and research, to the most skillful devices of man, and to the great multiplicity of human exchanges and events. Agriculture is like the background of a large painting holding complacently in its lap, as if fondling them, humans playing as many sustained parts of a drama as there are individuals.

An extensive western farmer makes a practice of sending his sons to engineering schools for their training, although he expects them home to resume farming. He avoids agricultural colleges. He has learned the value of the intensive training of the engineer, and has recognized the importance of mechanical devices on the farm. By so doing he has recognized,

however, only a single aspect of farming, although he understands the values of intensive education, and appreciates only a few values of agriculture. His ideas should be, more completely, engineering not only in mechanical devices, but in physics, chemistry, microbiology, botany, zoölogy, entomology, plant and animal diseases, plant and animal breeding, soil fertility, crop production, animal production, administration, business and social contacts. Such engineering courses are essential in the understanding and interpretation of agriculture, while the western farmer's attack is a single-track approach to it. This is not saying too much for agriculture, for how can soil be intelligently interpreted without a knowledge of the physics, chemistry and microbiology underlying its nature; how can crops be fully comprehended without a knowledge of the botanical laws of plant life; how can animals be known in health and disease without a knowledge of anatomy, physiology and the causes of disease; how can breeding proceed sanely without a knowledge of the genetic laws governing plants and animal life; how can man proceed to preserve food unless he knows the habits of those organisms which cause spoilage and poisoning; how can a man understand business in a wholesome manner unless he knows something about the principles of banking, transportation and other economic problems? These are only a few suggestive reflections in the vast field of agriculture. This answer may be made to the above questions: There are apparently quite successful farmers who would not qualify under these terms. This is allowed. As in every walk of life there exist "recipe" farmers as there exist "recipe" medical men, and they are needed, but this type never contributes to progress, although they sometimes produce sensational kaleidoscopic pictures within their own very restricted boundaries. Men may gain this training by individual study and experience. Such men are the strongest for such development, but, too, such men are very, very rare. Agriculture is suffering intensely from a lack of well-trained, understanding and sympathetic men, — men who are basicly and fundamentally trained, so well trained, in short, that they will be able to build out of the elemental material, rendered available from time to time, new practices,

new growth, and, in fact, progressive fundamental development in agriculture. Is a man a banker because he can buy a draft; a man a carpenter because he can shingle a roof; a man a merchant because he can sell carpetsweepers; and finally, is a man a farmer because he can grow a crop of corn? The greatest hindrance to professional agriculture at the present time is too frequently the antagonism offered by men who are actually engaged in agriculture, who occupy a very limited niche in agriculture, and who have only a very narrowed and restricted vision when regarding it; in other words, practical men of agriculture think only of formulated action without regard to agricultural development. Agriculture to such men is mere mechanical business.

No single human can master the entire field of agriculture. He should be in sympathy with every phase, and should have a general knowledge of every aspect to found his sympathy upon. *Intense specialization, therefore, after securing a general basic training*, is almost essential for successful pursuit in any growing agricultural undertaking. *Here is where the Graduate School functions*: After proper basic and general training has been obtained, in undergraduate study, it takes the student for intensive, comprehensive, effective and sympathetic training in the various special or prescribed fields of agriculture.

It follows that the Graduate School gives emphasis to a study in the —

1. Practices employed in agriculture as found in the Departments of Agronomy, Animal Husbandry, Dairying, Horticultural Manufactures, Landscape Architecture, Pomology, Poultry Husbandry, Vegetable Gardening.

2. Sciences underlying these practices as found in the Departments of Botany, Chemistry, Entomology, Mathematics, Microbiology, Physics, Veterinary Science, Zoölogy.

3. Economic phases of agriculture or business relations as found in the Departments of Agricultural Economics and Farm Management.

4. Social aspects of agriculture and rural life as found in the Departments of Agricultural Education and Rural Sociology.

## THE ARTICULATION OF UNDERGRADUATE AND GRADUATE WORK.

College undergraduate work should deal with such preparation as will enable a man to begin to pursue intimately, fundamentally, successfully, and without too great restriction, any special and selected line of study or practice related to agriculture in its relations to itself, to other subjects and to society. At the same time, it should equip him to appreciate intelligently his complete environment for purposes of social evolution, social contacts and usefulness in the world.

Graduate study and training lead to a more intensive, more specific and more masterful usefulness in definite fields; also to more exact and effective thinking, to greater initial values and to greater efficiency. While it is a continuation of undergraduate work with changed attitudes, methods and purposes, it brings to consciousness broader provinces of knowledge, a keener power of analysis and synthesis, and a greater capacity for creative and safe performance.

## REQUIREMENTS OF A GRADUATE SCHOOL.

1. First-class men for research and instruction, who have had or should have proper training, and should appreciate graduate study and its significance of values.

2. Equipment enabling men and students to pursue their studies and carry on research work unhampered.

Both of the above are to be found or should be found for undergraduate and Experiment Station efforts.

## THE APPRENTICESHIP SYSTEM.

In attempting to carry out the graduate study in this institution the apprenticeship system has been adopted. This consists in associating with each graduate instructor from one to three graduate assistants, who not only aid the instructor, but are brought into a more intimate contact with his special or major field of activity. While so closely associated with their major studies, these assistants or apprentices have the privilege of gaining such supporting work and broader interpretations as may be available in other departments of this

institution, or wherever such is to be found in other institutions, in its strongest form. By this scheme the cost to the institution is materially reduced as well or rendered nil. The system has worked so well that its value has not only been demonstrated to the institution, but it has enabled instructors to estimate the value of students thus employed much more accurately, and has contributed much to the training of students themselves.

### THE SPIRIT OF A GRADUATE SCHOOL.

A controlling spirit directs the destiny of purposes, likewise a controlling spirit pervades the atmosphere of a graduate school. It is not always easy to detect or define what form the spirit takes. That it makes for betterment in agriculture is patent, whether it is a spirit which favors practice, research, education or social conditions. As it reveals itself, it seeks in practice to widen the horizon, embodying a familiarity with the methods employed in various sections of the country; to deepen the knowledge of detail, circumstances, location, and all the known factors controlling or influencing; to understand the bearing of research and its application to practice; to relate practice to commerce and to amalgamate all elements involved into a useful country life of elevating character; it seeks in research to find those principles or laws which make working policies possible, and those facts which will serve agriculture as the fertile elements of the soil serve the plant (while these facts make it possible for "recipe" farmers to work their farms, they also furnish the material out of which the professional type of farmer creates new practices and new successes or improvement); it seeks in education to acquaint the individual with such knowledge as will make him a more effective agent, and give mental discipline for purposes of mental vigor and accuracy; it seeks to remind man that he is a social agent, a member of society, and has a social relation. Such is assumed to be a skeleton outline of the spirit, and, in short, it is the uplift-material of the individual in his social contacts and environments and his work as he is found in the country, but it is not the spirit which stimulates and produces. It is the channel through which the spirit struggles for results.

Underneath all of this should be a real constructive spirit-agent manifesting itself through enthusiasm in work and devotion to agriculture by a craving to find new truths and new facts which will aid; by an eagerness to disseminate such truths and facts as have been found useful and may become advantageous; by a keenness of purpose to establish practices upon a basis of proved evidence and not haphazard and careless observation. Such a spirit should take absolute possession of the energies of the individual, and should be productive to the greatest good; it should be as unhampered as possible, as free as is conformable with liberty; it should not be burdened and curbed by the friction of the stupendous burden of multiple organizing mechanisms or agents; it should possess an unharrowed existence, otherwise it will die. Its death is the death of progress.

#### OCCUPATION OF GRADUATE STUDENTS.

Fully as large a percentage enter some phase of agricultural work as is the case with the undergraduate students.

Some idea of the outlets for graduate students may be gained by the following concise suggestive statements from several of the departments doing graduate work.

*Department of Agricultural Education.* — Highly trained men are needed in the field of education, as teachers in the high schools and colleges; Extension teachers; supervisors and directors of agricultural and other vocational teaching; training teachers of agriculture; superintendents of rural schools; directors of the county Y. M. C. A. work, Boy Scouts and agricultural clubs; and as agricultural missionaries and trainers of rural teachers in the field of missions.

*Department of Agronomy.* — Men highly trained in the study of soil fertility and field crops are needed as teachers, research workers and specialists in our agricultural colleges, experiment stations and United States Department of Agriculture. In commercial work they are needed for research and in an advisory capacity. Such work includes soil survey, study of fertilizer resources, problems in the nutrition of plants, plant breeding, etc.

*Department of Botany.* — In botany there are large opportuni-

ties in several branches of the science. Teachers in general botany, mycology, pathology and physiology are in demand by agricultural colleges. Well-trained specialists for research, especially in pathology and physiology, are always needed by the experiment stations and the United States Department of Agriculture, and the supply never equals the demand. The call for trained botanists comes not alone from the institutions devoted to agriculture, for the science is taught in practically all colleges and universities. There are frequent opportunities to place men in both teaching and research positions, many of which are very desirable.

*Department of Chemistry.* — In chemistry, particularly in its relation to agriculture, the demand for well-trained chemists at the present time exceeds the supply. Men who specialize in chemistry in the undergraduate course are fitted for positions in agricultural industries, — fertilizer, feed and insecticide manufacture, — as well as in other lines of industry, and in the State experiment stations and commercial laboratories. Men are encouraged, by the aid of graduate assistantships, to take postgraduate courses and fit themselves for advanced positions in industry, as well as for teachers and research workers in our colleges and experiment stations. Well-trained men with ambition and earnestness of purpose are reasonably sure to secure satisfactory positions.

*Department of Entomology.* — Thoroughly trained men are needed in entomology, as Experiment Station entomologists and their assistants, in the same line of work; scientific assistants connected with the United States Bureau of Entomology, working on injurious insects in all parts of the country; entomologists connected with county farm bureaus, to advise, direct and supervise control work; Extension entomologists connected with the different agricultural colleges; teachers of entomology in agricultural high schools, other schools and in colleges; and as business men who contract for work as caretakers of trees, shrubs, etc., on estates, in cities and towns and elsewhere, protecting them from insect depredations and the attacks of disease, pruning, filling cavities, spraying and in other ways preserving them in good condition.

*Department of Landscape Gardening.* — There are unlimited opportunities for men of broad education and thorough tech-



nical training in landscape gardening, as, for example: in professional practice; in the employ of established architects, engineers, architects and town planners, State and municipal or private parks; as recreation engineers in parks and forests, in institutional planning and superintendence, in teaching and Extension work, with nursery firms and construction contractors, etc.

*Department of Microbiology.* — Microbiologists are needed in practical and research dairying, in soil biological studies, in food drying, refrigerating, canning, brining, fermenting and preserving; in food decomposition, poisoning and sanitation; in fermentations, as vinegar and industrial processes; in public health problems, as water supplies, sewage disposal, food supplies; in communicable diseases of men, plants and animals. Each of the latter in agriculture falls in specialized departments.

*Department of Poultry Husbandry.* — Highly trained men are needed in the field of poultry husbandry as investigators in the refrigeration of poultry; candling, packing and transportation of poultry and eggs; preparation of poultry for market (fattening); the study of the inheritance of various characters and functions; management; general sanitary methods and pathology; incubation, brooding and growth; also instructional work.

CHARLES E. MARSHALL,  
*Director.*

### Report of the Director of Short Courses.

The demand for Short Course work in this College, as may be seen from the following table, has steadily increased: —

	1918	1919	1920
The Two-Year Course, . . . . .	37	238	277
The Ten Weeks' Winter School, . . . . .	91	63	112
The Summer School, . . . . .	68	238	322 <sup>1</sup>
The Vocational Poultry Course, . . . . .	5	13	19

<sup>1</sup> Four and eight weeks.

The substantial financial support granted by the Legislature of the Commonwealth for Short Course work has enabled the College to meet this growing demand. The increased enrollment and the development of courses have given rise to problems that should have immediate consideration. These may be summarized as follows:—

1. The organization of intensive vocational lines of work in the second year of the Two-Year Course.
2. Provision for housing the student body.
3. The development of a separate Short Course staff.
4. A modification of the 'Ten Weeks' Winter School so that it will more fully serve the people of the Commonwealth.
5. The organization of social science courses in the Summer School.

*The Organization of Intensive Vocational Courses.*—The course of study for the Two-Year Course as now arranged provides for certain required courses during the first year, with a few electives. During the second year there are but few required courses, and the work is chiefly elective, as will be seen from the course of study included in this report. The present organization of the course fails to meet the real needs of the students. The interests of these students are very specialized. They wish to devote practically all of their time to one or two subjects. They object, and I share their objection, to being compelled to carry courses in which they are not interested merely to fill out the program. Students ask, for example, not for five hours a week of poultry or fruit growing, but ten or fifteen hours a week. I would respectfully suggest that we endeavor to reorganize the work of the second year, giving much more time to each of the subjects, and then permitting the students to carry but two major subjects with one required general course in addition; that is, a student might carry in one term, farm management, dairying, animal husbandry. I urge this modification for two reasons: (1) the men will be far better prepared for their life work; and (2) it will more clearly differentiate the four-year and the two-year work. The Two-Year Course is a vocational course and should be made such.

The following table, showing that 57 per cent of the students enrolled in the Two-Year Course are twenty-one years of age or

over, is included to point out the fact that this student body is relatively mature, and that the mind of the individual student is pretty well fixed on a certain goal before he comes to College: —

AGE (YEARS).	Number.	Per Cent.
17, . . . . .	19	6.7
18, . . . . .	33	11.3
19, . . . . .	34	12
20, . . . . .	36	13
21, . . . . .	26	9
22, . . . . .	24	8
23, . . . . .	19	7
24, . . . . .	14	5
25 and over, . . . . .	75	28
Totals, . . . . .	280	100

*Provision for Housing the Student Body.* — It will be noted that the attendance for the Winter School is small. Under present housing conditions it has to be kept small. The opportunities for service to the State are limited by the fact that Amherst does not provide sufficient housing accommodations. I wish to urge just as emphatically as possible the need for dormitories that will accommodate a portion of the student body. It is immaterial to my mind whether the dormitories be built for four-year men or for two-year men. The building of a dormitory will release a certain number of rooms that may be used for student accommodations, thus making it possible for us to house the students that come to the College.

*The Development of a Short Course Staff.* — Thus far no special Short Course staff has been organized for the instruction of the Short Course men, although a number of the general College staff are paid from Short Course funds. It seems to me the time has come when we should begin to develop a Short Course staff made up of men particularly fitted for this type of teaching. Such a staff would bear the same relation to the general staff that the Extension Service men now bear to the departments. There are two great advantages to this plan: (1) it creates a body of men who are especially interested

in the success of the Short Course students; and (2) it promotes good feeling between the four-year and the two-year men, in that neither will feel that the other has an advantage.

*A Modification of the Ten Weeks' Winter School.* — I wish to suggest a very radical change in the organization of the Ten Weeks' Winter School. All of the courses with one exception now offered in the Ten Weeks' Winter School run ten weeks, and the student has to take a general diversified program. There is one exception to this — there is the dairy school which is practically a separate school in itself. My suggestion is that there be organized a series of schools that would last, two, four, six, eight or ten weeks, and that all these schools come under the title of eight or ten weeks' winter schools. I think eight is preferable to ten, in that the students now enrolled in the Winter School of Ten Weeks are very anxious to leave during the last week or two to begin work.

*The Organization of Social Science Courses in the Summer School.* — The College should take through its Short Course work a more definite step toward the organization of social science courses in the Summer School. There is a demand — a demand that we have never met — for the preparation of men and women for social service. I suggest that we should begin this next year in the Summer School the development of courses that will fit men and women of maturity and rural experience for work in this field.

*The Federal Board for Vocational Education.* — The Federal Board for Vocational Education has selected this College as one of the training centers for the men disabled in military and naval service of the United States. These men vary in academic preparation from College graduates to men who have not completed the common schools. They range in age from eighteen to fifty years. The majority of them are enrolled in the Two-Year Course. The need of these men for education that will fit them for life is very great. The experience for the past two years has shown that the adjustment the men had to make from war to peace was far greater than the adjustment from peace to war. Approximately 50 Federal students will complete the Two-Year Course in March of this year. In order to make provision for the men who had no

previous education, or whose previous education was very limited, special unit courses were organized in co-operation with the Federal Board for Vocational Education. In these courses men were taught to read, write and speak the English language, besides being given instruction, at the same time, in agricultural and horticultural subjects. It is interesting to note that many of these men who practically had to be taught to read and write will be able, within the next six months, to enter the Two-Year Course. Approximately 300 Federal students have been enrolled in Short Courses since June, 1919.

*The Summer School for 1920* was managed co-operatively by the Massachusetts Agricultural College and the Division of Elementary and Normal Schools of the State Department of Education. The College offered subjects in agriculture, horticulture and related subjects. The State Department of Education provided courses in elementary education for teachers. The arrangement was even more popular than for the summer of 1919. Many expressions of appreciation of the plan were offered by the students. By special arrangement courses were provided for the Federal students. I suggest that the plan of co-operation between the two agencies be continued for another summer.

*Supervision of Farm Practice.* — The need of supervision of the students in the Two-Year Course, during the six months that they are required to work on a farm, was met by the appointment of Mr. Willard K. French as assistant professor of farm management. Mr. French has undertaken the work with a good deal of enthusiasm and energy. I feel sure that under his direction the six months spent on a farm by our two-year students will be of very great value to the whole course. Mr. French's duties include, also, assisting the men to find positions on completion of their course.

JOHN PHELAN,  
*Director.*

## TABLES AND STATISTICS.

TABLE I. — *Resignations.*

POSITION.	Name.
Supervisor of Correspondence Courses and Extension editor, . . . . .	L. Wayne Arny.
Stenographer, Department of Rural Home Life, . . . . .	Nellie V. Barkhouse.
Private secretary, president's office, . . . . .	Evelyn Brewster.
Clerk, treasurer's office, . . . . .	Ruth Brooks.
Instructor in physics, . . . . .	Henry J. Burt.
Assistant chemist, Experiment Station, . . . . .	Arthur M. Clarke.
Professor of forestry, . . . . .	William D. Clark.
Clerk, treasurer's office, . . . . .	Grace M. Colburn.
Extension assistant professor of animal husbandry, . . . . .	Roy B. Cooley.
Assistant professor of agronomy, . . . . .	Herbert P. Cooper.
Cataloguer at library, . . . . .	Lalia M. Damon.
Instructor in poultry husbandry, . . . . .	A. Lawrence Dean.
Library assistant, . . . . .	Louise J. Delano.
Assistant, Department of Physical Education, . . . . .	Llewelyn L. Derby.
Clerk, Department of Microbiology, . . . . .	Marion F. Dondale.
Clerk, Extension Service, . . . . .	Hazel E. Donovan.
Clerk, power plant, . . . . .	Noellia C. Duval.
Stenographer, treasurer's office, . . . . .	Charlotte E. Erickson.
Library assistant, . . . . .	Lottie M. Fosdick.
Stenographer, registrar's office, . . . . .	Margaret Gaskill.
Assistant leader, rural home economic projects, . . . . .	Laura R. Gifford.
Clerk, Extension Service, . . . . .	Lillian S. Hadfield.
Clerk, Department of Agricultural Economics, . . . . .	Laura W. Hager.
Stenographer, Extension Service, . . . . .	Catherine A. Harrington.
Extension specialist in sheep husbandry, . . . . .	Henry E. Haslett.
Clerk, Extension Service, . . . . .	Marion Hawthorne.
Instructor in microbiology, . . . . .	Edgerton G. Hood.
Instructor in animal husbandry, . . . . .	Richard L. Holden.
Assistant in veterinary science, . . . . .	T. George Hull.
Assistant in physical education, . . . . .	Brooks F. Jakeman.
Extension specialist in dairying, . . . . .	Delos L. James.
Extension associate professor of agronomy, . . . . .	Earl Jones.
Assistant physical education, . . . . .	Arthur M. McCarthy.

TABLE I. — *Resignations* — Concluded.

POSITION.	Name.
Professor of animal husbandry, . . . . .	John C. McNutt.
Instructor in agronomy, . . . . .	Frederick G. Merkle.
Extension professor of community planning, . . . . .	Ezra L. Morgan.
Associate professor of language and literature, . . . . .	Robert W. Neal.
Extension instructor in agricultural education, . . . . .	Helen M. Norris. <sup>1</sup>
Resident nurse, . . . . .	Elizabeth Olmstead.
Clerk, president's office, . . . . .	Rachel C. Packard.
Clerk, Extension Service, . . . . .	Helen L. Phillips.
Clerk, Department of Dairying, . . . . .	Frances Powers.
Chief clerk, Extension Service, . . . . .	Jessie M. Prince.
Clerk, president's office, . . . . .	Marjorie T. Silcox.
Field agent, . . . . .	Almon W. Spaulding.
Instructor in farm management, . . . . .	Leland Spencer.
Clerk, treasurer's office, . . . . .	Miriam Spencer.
Stenographer, Extension Service, . . . . .	Marjorie E. Sullivan.
Stenographer, Extension Service, . . . . .	Aline B. Suprenant.
Stenographer, Extension Service, . . . . .	Clara A. Swift.
Associate professor of physics, . . . . .	Harry C. Thompson.
Instructor in dairying, . . . . .	Stanley E. VanHorn.
Clerk, Division of Agriculture, . . . . .	Marion L. Warner.
Instructor and foreman in vegetable gardening, . . . . .	Gilbert S. Watts.
Stenographer, Department of Botany, . . . . .	Ellen L. Welch.
Instructor in dairying, . . . . .	Fred E. Wheeler.
Stenographer, Extension Service, . . . . .	Mrs. Ruth S. Worthley.
Assistant to the director, Extension Service, . . . . .	John D. Zink.

<sup>1</sup> Resignation takes effect Dec. 18, 1920.TABLE II. — *New Appointments.*A. *In the Academic Departments.*

POSITION.	Name.	Degrees.
Instructor in mathematics, . . .	Francis P. Clark, . . .	B.Sc., Catholic University, 1920.
Instructor in entomology, . . .	William L. Dowd, . . .	B.Sc., Massachusetts Agricultural College, 1920.
Assistant professor of farm management.	Willard K. French, . . .	B.Sc., Massachusetts Agricultural College, 1919.
Professor of forestry, . . .	Laurence R. Grose, . . .	A.B., Brown University; M.F., Harvard Forestry School.
Professor of physics, . . .	Elmer A. Harrington, . . .	A.B., Clark College, 1905; A.M., Clark University, 1906; Ph.D., Clark University, 1915.

TABLE II. — *New Appointments* — Continued.A. *In the Academic Departments* — Concluded.

POSITION.	Name.	Degrees.
Instructor in market gardening, .	Roy D. Harris, .	B.Sc., Middlebury College, 1920.
Assistant, physical education, .	Brooks F. Jakeman, .	B.Sc., Massachusetts Agricultural College, 1920.
Instructor in microbiology, .	James Neill, .	B.Sc., Allegheny College.
Instructor in horticultural manufactures.	William F. Robertson, .	B.Sc., Massachusetts Agricultural College, 1920.
Instructor in poultry husbandry, .	William E. Ryan, .	B.Sc., Massachusetts Agricultural College, 1916.
Professor of animal husbandry, .	Schuyler M. Salisbury, .	B.Sc., Ohio State University, 1913.
Professor of rural sociology, .	Newell L. Sims, .	A.M., Columbia University, 1910; Ph.D., Columbia University, 1913.
Instructor in home economics, .	Mrs. Julia G. Strahan, .	B.Sc., Teachers' College, 1920.
Instructor in animal husbandry, .	Weston C. Thayer, .	B.Sc., Massachusetts Agricultural College, 1920.
Instructor in agronomy, .	Guy A. Thelin, .	B.Sc., South Dakota Agricultural College, 1920.
Instructor in physics, .	Alfred L. Tower, .	B.Sc., Massachusetts Agricultural College, 1914.
Instructor in dairying, .	Glen E. Upton, .	B.Sc., Cornell University, 1920.
Assistant professor of dairying, .	T. George Yaxis, .	B.Sc., New Hampshire College, 1914; M.Sc., Cornell University, 1917.

B. *In the Experiment Station.*

Director, . . . . .	Sidney B. Haskell, .	B.Sc., Massachusetts Agricultural College, 1904.
Assistant research professor of veterinary science.	John B. Lentz, .	A.B., Franklin and Marshall College, 1908; V.M.D., University of Pa., 1914.
Research professor of pomology, .	Jacob K. Shaw, .	B.Sc., University of Vermont, 1899; M.Sc., Massachusetts Agricultural College, 1908; Ph.D., Massachusetts Agricultural College, 1911.
Assistant chemist, . . . .	Raymond W. Swift, .	B.Sc., Massachusetts Agricultural College, 1920.
Investigator in entomology, .	Harlan N. Worthley, .	B.Sc., Massachusetts Agricultural College, 1920.

C. *In the Extension Service.*

Supervisor of Extension schools and exhibits.	Robert D. Hawley, .	B.Sc., Massachusetts Agricultural College, 1920.
Extension editor and supervisor of Correspondence Courses.	Louis M. Lyons, .	B.Sc., Massachusetts Agricultural College, 1918.
Extension professor of farm management and demonstrations.	Allister F. McDougall, .	B.Sc., Massachusetts Agricultural College, 1913.
Extension professor of agricultural economics.	Robert J. McFall, .	A.B., Geneva College, 1912; A.M., Glasgow University, 1914; Ph.D., Columbia University, 1916.
Extension assistant professor of landscape gardening.	William E. Philbrick, <sup>1</sup>	B.Sc., Massachusetts Agricultural College, 1912.
Assistant State home demonstration agent.	Lucy M. Queal, <sup>2</sup> .	B.Sc., Teachers' College, 1920.
Extension assistant professor of home economics.	Mrs. Ruth S. Reed, .	- - -
Assistant State home demonstration agent.	Marie Sayles, .	M.Sc., Teachers' College.

<sup>1</sup> To take effect Jan. 1, 1921.<sup>2</sup> Temporary.



TABLE II. — *New Appointments* — Continued.*D. Miscellaneous.*

POSITION.	Name.	Degrees.
Field agent, . . . . .	George M. Campbell, .	B.Sc., Massachusetts Agricultural College, 1920.
Resident nurse, . . . . .	Grace Charman, . .	— — —
Resident nurse, . . . . .	Marguerite Davis, .	— — —
Superintendent of dairy manufactures.	Adelbert Sheffield, .	— — —

*E. In the Clerical Staff.*

POSITION.	Name.
Library assistant, . . . . .	Florence Archibald.
Stenographer, Extension Service, . . . . .	Mrs. Esther W. Arp.
Stenographer, Department of Rural Home Life, . . . . .	May G. Arthur.
Clerk, Department of Microbiology, . . . . .	Mrs. Celena M. Baxter.
Clerk, Department of Dairying, . . . . .	Ruth L. Brown.
Library assistant, . . . . .	Margery Burnett.
Bookkeeper, treasurer's office, . . . . .	Grace Corbett.
Stenographer, Extension Service, . . . . .	Florence E. Day.
Stenographer, Department of Rural Sociology, . . . . .	Rose Delaney.
Clerk, power plant, . . . . .	Hazel Donovan.
Stenographer, president's office, . . . . .	Margaret Fish.
Stenographer, Department of Agronomy, . . . . .	Katherine Harris.
Clerk, Department of Physical Education, . . . . .	E. Franklin Holland.
Stenographer, dean's office, . . . . .	Gertrude E. Hollis.
Stenographer, president's office, . . . . .	Catharine E. Honney.
Cataloguer, library, . . . . .	Florence B. Kimball.
Stenographer, Division of Agriculture, . . . . .	Aline J. Legare.
Stenographer, treasurer's office, . . . . .	Marion B. Macarty.
Stenographer, Market-Garden Field Station, . . . . .	Edith Meehan.
Assistant librarian, . . . . .	Katherine Middleton.
Stenographer, Extension Service, . . . . .	Doris Millett.
Clerk, treasurer's office, . . . . .	Mrs. Jessie A. Neill.
Stenographer, registrar's office, . . . . .	Julietta O'Donnell.
Clerk, Extension Service, . . . . .	Corinne T. Petit.
Stenographer, Extension Service, . . . . .	Mildred Putney.
Private Secretary, Division of Rural Social Science, . . . . .	Helen M. Rand.
Stenographer, Extension Service, . . . . .	Helen Reardon.

TABLE II. — *New Appointments* — Concluded.*E. In the Clerical Staff* — Concluded.

POSITION.	Name.
Stenographer, Extension Service, . . . . .	Josephine B. Reed.
Clerk, treasurer's office, . . . . .	Mrs. Ruth L. Rodwaye.
Stenographer, Division of Horticulture, . . . . .	Ora E. Rouleau.
Clerk, Extension Service, . . . . .	Sadie Shores.
Clerk, president's office, . . . . .	Harriet A. Smith.
Clerk, Department of Agricultural Economics, . . . . .	Mary A. Smith.
Clerk, treasurer's office, . . . . .	Miriam Spencer.
Stenographer, Extension Service, . . . . .	Catherine White.
Stenographer, Extension Service, . . . . .	Mrs. Ruth S. Worthley.

TABLE III. — *Speakers for the Year.**A. Speakers at Wednesday Assembly for Year ending Nov. 30, 1920.***1919.**

- Dec. 3. — Prof. Harold Whitehead, Boston University, Boston.  
 Dec. 10. — Prof. Winthrop S. Welles, M. A. C.  
 Dec. 31. — Prof. Frank A. Waugh, M. A. C.

**1920.**

- Jan. 7. — Student forum.  
 Jan. 14. — Prof. Ernest Barker, Oxford University, England.  
 Jan. 21. — Mr. Sam Higginbottom, India.  
 Jan. 28. — Signora Agresti, Rome.  
 Feb. 4. — Dr. Rosalie S. Morton, New York City.  
 Feb. 11. — Hon. Allen T. Treadway, Washington, D. C.  
 Feb. 18. — Student forum conducted by Prof. R. J. Sprague.  
 Feb. 25. — Mr. Walter H. Smith, Manchester, N. H.  
 Mar. 3. — Student forum.  
 Mar. 10. — Student forum.  
 Mar. 31. — Student forum conducted by Prof. R. J. Sprague.  
 Apr. 7. — Director John D. Willard, M. A. C.  
 Apr. 14. — Student forum conducted by Prof. R. J. Sprague.  
 Apr. 21. — Rev. Harold Marshall, Boston.  
 Apr. 28. — Student forum.  
 May 5. — Mr. Charles A. Lyman, Washington, D. C.  
 May 12. — Freshman-Sophomore debate.  
 May 19. — Rev. J. Burford Parry, Springfield.  
 June 2. — Burnham prize contest.  
 June 9. — Prof. L. H. Bailey, Ithaca, N. Y.  
 Sept. 29. — Pres. Kenyon L. Butterfield.  
 Oct. 6. — Student forum.  
 Oct. 13. — Mr. J. Horace McFarland, Harrisburg, Pa.  
 Oct. 20. — Mr. Ezra L. Morgan, Washington, D. C.  
 Oct. 27. — Student forum.  
 Nov. 3. — Mr. Roger W. Babson, Wellesley, Mass.  
 Nov. 10. — Pres. Frank P. Speare, Boston.  
 Nov. 17. — Mr. George T. Powell, Brookfield.

*B. Speakers at Sunday Chapel for Year ending Nov. 30, 1920.***1919.**

Dec. 7. — Rev. Samuel A. Eliot, Boston.

Dec. 14. — Rev. William H. Day, Bridgeport, Conn.

**1920.**

Jan. 4. — Rev. William A. Atkinson, Amherst.

Jan. 11. — Bishop Edwin H. Hughes, Malden.

Jan. 18. — Rev. Jason Noble Pierce, Dorchester

Jan. 25. — Dr. William E. Strong, Boston.

Feb. 1. — Dr. Sidney L. Gulick, New York City.

Feb. 8. — Mr. Alfred E. Stearns, Andover.

Feb. 15. — Rev. W. W. Weeks, Springfield.

Feb. 22. — Mr. Hamilton Holt, New York City.

Feb. 29. — Mr. Albert E. Roberts, New York City.

Mar. 7. — Dr. John Herman Randall, New York City.

Mar. 14. — Rev. J. Burford Parry, Springfield.

Apr. 4. — Dr. John M. Tyler, Amherst.

Apr. 11. — Rev. J. Edgar Park, West Newton.

Apr. 18. — Pres. John M. Thomas, Middlebury, Vt.

Apr. 25. — Rev. Archibald Black, Boston.

Oct. 3. — Pres. Kenyon L. Butterfield.

Nov. 7. — Hon. William H. Taft, New Haven, Conn.

Nov. 14. — Rev. John Herman Randall, New York City.

Nov. 21. — Rev. William A. Atkinson, Amherst.

TABLE IV. — *Attendance.**A. In Work of College Grade.*

CLASS.	REGISTRATION NOV. 30, 1919.			REGISTRATION NOV. 30, 1920.		
	Men.	Women.	Total.	Men.	Women.	Total.
Graduate students, . . . .	31	2	33	41	7	48
Senior class, . . . . .	110	3	113	94	3	97
Junior class, . . . . .	100	3	103	94	5	99
Sophomore class, . . . .	108	4	112	96	8	104
Freshman class, . . . . .	116	9	125	124	11	135
Unclassified students, . .	24	9	33	9	1	10
Special students, . . . .	—	—	—	11	2	13
Totals, . . . . .	489	30	519	469	37	506

*B. Short Course Enrollment.*

Two-Year Course, second year,	18	—	18	125	10	135
Two-Year Course, first year, .	183	8	191	130	12	142
Vocational Poultry Course, .	13	—	13	19	—	19
Rural Engineering Course, .	16	—	16	—	—	—
Unit Course, . . . . .	—	—	—	50	—	50
Totals, . . . . .	230	8	238	314	22	336

TABLE IV. — Attendance — Concluded.

*C. Other Short Course Enrollment.*

	REGISTRATION 1918-19.			REGISTRATION 1919-20.		
	Men.	Women.	Total.	Men.	Women.	Total.
Winter school, . . . . .	43	20	63	90	22	112
Summer school, . . . . .	46	192	238	107	150	257
Summer school for Federal men,	31	—	31	65	—	65
Six weeks' course, . . . . .	22	1	23	—	—	—
Totals, . . . . .	142	213	355	262	172	434

*D. Convention Registration.*

	1919.	1920.
Farmers' week, . . . . .	898	1,301
County agents' conference, . . . . .	30	85
Poultry convention, . . . . .	200	400
Boys' camps, . . . . .	52	160
Girls' camp, . . . . .	33	186
	1,213	2,132

TABLE V. — Legislative Budget, 1920.

ITEMS.	Amount asked.	Amount granted.
Library building and equipment, . . . . .	\$425,000	—
Chemistry laboratory, . . . . .	600,000	—
Miscellaneous improvements and equipment, . . . . .	120,000	\$50,000
House for farm help, . . . . .	5,000	—
Extension for rural engineering shops, . . . . .	25,000	—
Improvements at power and heating plant, . . . . .	80,000	—
Stable for cavalry unit, . . . . .	15,000	15,000
	\$1,270,000	\$65,000

TABLE VI. — *Current Account, State Funds.*

	Requested 1920.	Appropriated 1920.	Deficiency Appropriation. <sup>1</sup>	Expended 1920.	Balance.
Personal services:—					
Administration, . . . .	\$40,220	\$38,000	—	\$38,082 71	—\$82 71
Instruction, . . . .	170,350	159,000	+\$215 56	149,319 85	9,895 71
General maintenance, . .	112,285	108,000	+145 65	110,672 91	—2,527 26
Experiment Station, . . .	62,510	41,000	—	43,060 36	—2,060 36
Extension Service, . . .	125,260	54,000	+5 60	48,371 91	5,633 69
Market-Garden Field Station,	5,400	5,400	—	5,277 29	122 71
Short Courses, . . . .	27,270	25,600	—	27,306 65	—1,706 65
Travel, office and other expenses.	41,325	41,000	+3,382 68	47,790 04	—3,407 36
Teaching, laboratory supplies and equipment.	70,600	67,000	+2,333 81	60,667 72	8,666 09
Experiment Station:—					
Supplies and equipment, .	14,050	10,000	+717 53	13,989 17	—3,271 64
Travel and office expenses, .	6,550	5,000	+99 16	3,314 54	1,784 62
Extension Service, supplies, equipment, travel, etc.	68,130	40,000	+976 28	36,416 55	4,559 73
Short Courses, . . . .	14,475	14,000	+56 45	7,940 56	6,115 89
Heat, light and power, . .	45,000	45,000	+325 95	65,803 86	—20,477 91
Farm, . . . .	26,780	26,780	+2,615 72	35,267 65	—5,871 93
Repairs, ordinary, . . . .	17,000	17,000	+132 00	16,898 28	233 72
Replacements, . . . .	5,000	3,700	—	2,644 54	1,055 46
Market-Garden Field Station,	3,000	3,000	+50 12	2,680 21	369 91
Fertilizer law control, . .	12,500	12,500	+83 93	12,410 84	173 09
Poultry disease law, . . .	4,000	3,000	+263 28	3,064 98	198 30
Milk-testing inspection law, .	550	550	—	525 08	24 92
Trustees, expenses, . . . .	1,200	1,200	+134 86	798 39	536 47
Printing reports, . . . .	6,000	5,500	—	1,641 27	3,858 73
Commercial feedstuffs, . .	6,000	6,000	+17 00	5,769 91	249 09
Totals, . . . .	\$858,455	\$732,230	\$11,555 58	\$739,713 27	\$4,072 31

<sup>1</sup> Deficiency appropriation to meet expenses incurred in 1918-19.

TABLE VII. — *Statistics of Freshmen entering Massachusetts Agricultural College, September, 1920.**A. Home Addresses of Students (classified by Towns and Cities).*

Adams, . . . . . 1	Hadley, . . . . . 1	Orange, . . . . . 2
Amherst, . . . . . 10	Hatfield, . . . . . 1	Pepperell, . . . . . 1
Ashfield, . . . . . 1	HAVANA, CUBA, . . . . . 1	PITTSFIELD, . . . . . 1
ATTLEBORO, . . . . . 1	Holbrook, . . . . . 1	PROVIDENCE, R. I., . . . . . 1
Barre, . . . . . 1	Holden, . . . . . 1	QUINCY, . . . . . 3
Belchertown, . . . . . 1	HOLYOKE, . . . . . 3	Rajputana, India, . . . . . 1
Belgrade, Serbia, . . . . . 1	Homestead, Pa., . . . . . 1	Rehoboth, . . . . . 1
Belmont, . . . . . 1	Kensington, Md., . . . . . 1	REVERE, . . . . . 1
Bernardston, . . . . . 1	Lancaster, . . . . . 1	Rockland, . . . . . 2
BEVERLY, . . . . . 1	Larchmont, N. Y., . . . . . 1	Royalston, . . . . . 1
Bloomfield, N. J., . . . . . 1	LEOMINSTER, . . . . . 1	Shelburne, . . . . . 2
Bosnia, Serbia, . . . . . 1	LOWELL, . . . . . 1	SOMERVILLE, . . . . . 1
BOSTON, . . . . . 6	LYNN, . . . . . 1	SPRINGFIELD, . . . . . 2
Bound Brook, N. J., . . . . . 1	Mansfield, . . . . . 1	Suffield, Conn., . . . . . 1
BROCKTON, . . . . . 2	Marblehead, . . . . . 1	Summit, N. J., . . . . . 1
Brookline, . . . . . 2	MARLBOROUGH, . . . . . 1	Sunderland, . . . . . 1
CAMBRIDGE, . . . . . 5	Medfield, . . . . . 1	Swampscott, . . . . . 1
Camden, Me., . . . . . 1	MEDFORD, . . . . . 1	TAUNTON, . . . . . 1
Charlestown, N. H., . . . . . 1	MELROSE, . . . . . 2	Townsend, . . . . . 1
Chepachet, R. I., . . . . . 1	Milford, . . . . . 1	WALTHAM, . . . . . 1
Chester, . . . . . 1	Millville, . . . . . 1	Ware, . . . . . 1
Concord, . . . . . 1	Milton, . . . . . 1	Wareham, . . . . . 1
Deerfield, . . . . . 1	Montague, . . . . . 2	Webster, . . . . . 1
East Bridgewater, . . . . . 1	Needham, . . . . . 1	Weehawken, N. J., . . . . . 1
East Longmeadow, . . . . . 1	New Platz, N. Y., . . . . . 1	West Bridgewater, . . . . . 2
FALL RIVER, . . . . . 1	NEW YORK, N. Y., . . . . . 1	WESTFIELD, . . . . . 3
FITCHBURG, . . . . . 3	NEWTON, . . . . . 5	Westport, . . . . . 1
Framingham, . . . . . 1	NORTHAMPTON, . . . . . 1	Wilbraham, . . . . . 4
GLOUCESTER, . . . . . 1	North Andover, . . . . . 1	WORCESTER, . . . . . 3
Greenfield, . . . . . 2	Oakham, . . . . . 1	WILLIMANTIC, CONN., . . . . . 1

*B. Home Addresses (classified by States).*

	Number.	Per Cent.		Number.	Per Cent.
Connecticut, . . . . .	2	1.48	New Jersey, . . . . .	4	2.97
Cuba, . . . . .	1	.74	New York, . . . . .	3	2.22
India, . . . . .	1	.74	Pennsylvania, . . . . .	1	.74
Maine, . . . . .	1	.74	Rhode Island, . . . . .	2	1.48
Maryland, . . . . .	1	.74	Serbia, . . . . .	2	1.48
Massachusetts, . . . . .	116	85.93		135	100.00
New Hampshire, . . . . .	1	.74			

TABLE VII. — *Statistics of Freshmen entering Massachusetts Agricultural College, September, 1920 — Continued.**C. Home Addresses (classified by Counties of Massachusetts).*

	Number.	Per Cent.		Number	Per Cent.
Berkshire, . . .	2	1.72	Middlesex, . . .	22	18.97
Bristol, . . .	6	5.17	Norfolk, . . .	9	7.76
Essex, . . .	6	5.17	Plymouth, . . .	8	6.90
Franklin, . . .	12	10.35	Suffolk, . . .	7	6.03
Hampden, . . .	14	12.07	Worcester, . . .	15	12.93
Hampshire, . . .	15	12.93		116	100.00

*D. Nativity of Parents.*

	Number.	Per Cent.
Neither parent foreign born, . . . . .	93	68.89
Both parents foreign born, . . . . .	23	17.04
Father (only) foreign born, . . . . .	8	5.93
Mother (only) foreign born, . . . . .	10	7.40
No statistics, . . . . .	1	.74
	135	100.00

*E. Education of Father.*

	Number.	Per Cent.
Common school, . . . . .	56	41.48
High school, . . . . .	31	22.96
Business school, . . . . .	11	8.15
College or university, . . . . .	33	24.45
No statistics, . . . . .	4	2.96
	135	100.00

TABLE VII. — *Statistics of Freshmen entering Massachusetts Agricultural College, September, 1920 — Continued.**F. Religious Census.*

	MEMBERSHIP.		PREFERENCE.		TOTALS.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Baptist, . . . . .	9	6.67	2	1.48	11	8.15
Catholic, . . . . .	13	9.63	2	1.48	15	11.11
Congregationalist, . . . . .	39	28.89	15	11.12	54	40.00
Episcopal, . . . . .	10	7.41	1	.74	11	8.15
Methodist, . . . . .	6	4.44	6	4.44	12	8.89
Presbyterian, . . . . .	3	2.22	—	—	3	2.22
Unitarian, . . . . .	8	5.93	3	2.22	11	8.15
Universalist, . . . . .	3	2.22	2	1.48	5	3.70
Miscellaneous, . . . . .	7	5.19	5	3.70	12	8.89
No statistics, . . . . .	1	.74	—	—	1	.74
	99	73.34	36	26.66	135	100.00

*G. Occupation of Father.*

	Number.	Per Cent.
Agriculture and horticulture, . . . . .	28	20.75
Artisans, . . . . .	29	21.49
Business, . . . . .	33	24.43
Deceased or no statistics, . . . . .	14	10.37
Miscellaneous, . . . . .	15	11.11
Professional, . . . . .	16	11.85
	135	100.00

*H. Intended Vocation of Student.*

	Number.	Per Cent.
Agriculture or horticulture (practical), . . . . .	57	42.23
Agriculture or horticulture (professional), . . . . .	39	28.89
Professions, . . . . .	3	2.22
Miscellaneous, . . . . .	5	3.70
Undecided or no statistics, . . . . .	31	22.96
	135	100.00



TABLE VII. — *Statistics of Freshmen entering Massachusetts Agricultural College, September, 1920 — Concluded.**I. Farm Experience.*

	Number.	Per Cent.
Brought up on a farm, . . . . .	43	31.85
Not brought up on a farm and having no or practically no farm experience.	26	19.26
Not brought up on a farm, but having had some farm experience,	66	48.89
	135	100.00

*J. Miscellaneous Statistics.*

Average age, . . . . . 19.30 years

TABLE VIII. — *Cases treated at the Infirmary Dec. 1, 1919, to Nov. 30, 1920.*

	Daily Count.	Individual.
<b>1919</b>		
December 1 to 31: —		
House cases, . . . . .	29	7
Out-patients, . . . . .	84	41
<b>1920</b>		
January 1 to 31: —		
House cases, . . . . .	143	35
Out-patients, . . . . .	159	94
February 1 to 29: —		
House cases, . . . . .	189	23
Out-patients, . . . . .	59	47
March 1 to 31: —		
House cases, . . . . .	12	4
Out-patients, . . . . .	33	22
April 1 to 30: —		
House cases, . . . . .	43	6
Out-patients, . . . . .	35	20
May 1 to 31: —		
House cases, . . . . .	23	5
Out-patients, . . . . .	68	21
June 1 to 30: —		
House cases, . . . . .	17	2
Out-patients, . . . . .	43	10
September 15 to 30: —		
House cases, . . . . .	1	1
Out-patients, . . . . .	11	7
October 1 to 31: —		
House cases, . . . . .	98	15
Out-patients, . . . . .	72	33
November 1 to 30: —		
House cases, . . . . .	96	12
Out-patients, . . . . .	66	31

Number of house cases, . . . . .	651
Number of out-patients, . . . . .	630
Total, . . . . .	1,281
Number cared for in the house, . . . . .	110
Number cared for as out-patients, . . . . .	326
Total, . . . . .	436

TABLE IX. — *Selected List of Publications of the Officers of the Institution*  
(December, 1919 — November, 1920).

- ARNY, L. WAYNE. Supervisor of Correspondence Courses.  
Editing the Farm Bureau Paper. Massachusetts Agricultural College. Extension Service. Extension Bulletin No. 28, December, 1919. 20 p.
- BEALS, CARLOS L. Assistant Research Professor of Chemistry.  
The Nutritive Value of Cattle Feeds. I. Velvet Bean Feed for Farm Stock. Massachusetts Agricultural Experiment Station. Bulletin No. 197, September, 1920. p. 61-74.  
The Nutritive Value of Cattle Feeds. II. Oat Feed for Farm Stock. Massachusetts Agricultural Experiment Station. Bulletin No. 200, November, 1920.
- BOURNE, A. I. Investigator in Entomology.  
Aphids or Plant Lice. Massachusetts Agricultural College. Extension Service. Extension Circular No. 79 M, 1920. 3 p.
- BROOKS, WILLIAM P. Consulting Agriculturist.  
A Fertilizer Experiment with Asparagus. Massachusetts Agricultural Experiment Station. Bulletin No. 194, December, 1919. p. 231-257.  
Methods of Applying Manure. Massachusetts Agricultural Experiment Station. Bulletin No. 196, September, 1920. p. 39-60.
- BUTTERFIELD, KENYON L. President.  
The Present Crisis. Baccalaureate Address. Massachusetts Agricultural College, June 20, 1920. Abstract in "Springfield Republican," June 20, 1920.  
President's Address. In Proceedings of the Third National Country Life Conference, October, 1920.
- CANCE, ALEXANDER E. Professor of Agricultural Economics.  
Prepare for the Census Taker. In County Farm Bureau Bulletins, December, 1919.
- CHAPMAN, GEORGE H. Research Professor of Botany.  
Curing and Fermentation Troubles of Tobacco and their Control. Massachusetts Agricultural College. Extension Service. Extension Bulletin No. 36, July, 1920. 15 p.  
Tobacco Investigations Progress Report. Massachusetts Agricultural Experiment Station. Bulletin No. 195, March, 1920. 38 p.
- CHENOWETH, WALTER W. Professor of Horticultural Manufactures.  
O Sweet, Sweet Cider! In Middlesex County Bulletin, December, 1919. p. 12.
- COLE, WILLIAM R. Assistant Extension Professor of Horticultural Manufactures.  
Home Storage. In New England Farms, Vol. 50, No. 45, Nov. 6, 1920. p. 8.  
Home Storage Room Plans. In Bristol County Farmers' Bulletin, October, 1920. p. 4.  
Old Cellar Holes may be Reconstructed. In Middlesex County Bulletin, May, 1920. p. 9.  
A Reason for Storing Apples. In Berkshire Farmers' Bulletin, May, 1920. p. 8, 9.
- COOLEY, ROY B. Assistant Extension Professor of Animal Husbandry.  
Choosing Dairy Cattle Feeds. In County Farm Bureau Bulletins, March and May, 1920.  
Food Advisory Report. In County Farm Bureau Bulletins, April, 1920.  
Pure Bred Sires Gaining. In County Farm Bureau Bulletins, May and June, 1920.  
Why Balanced Rations? In County Farm Bureau Bulletins, July and August, 1920.  
Wintering Brood Sows. In County Farm Bureau Bulletins, December, 1919.
- CRAMPTON, GUY C. Professor of Insect Morphology.  
Some Anatomical Details of the Remarkable Winged Zorapteron, *Zorotypus Hubbardi* Caudell, with the Notes on its Relationships. Proc. Ent. Soc., Washington, Vol. 22, No. 5, 1920. p. 98-106.  
Remarks on the Basic Plan of the Terminal Abdominal Structures of the Males of Winged Insects. Canadian Entomologist, Vol. 52, No. 8, 1920. p. 178-183.  
The Terminal Abdominal Structures of the Primitive Australian Termite, *Mastotermes Darwinensis* Froggatt. Trans. Ent. Soc., London, 1920. p. 137-145.  
Remarks on Dr. MacGillivray's Paper entitled "The Eyes of Insects." Entomological News, Vol. 31, 1920. p. 153-155.  
A Comparison of the External Anatomy of the Lower Lepidoptera and Trichoptera from the Standpoint of Phylogeny. Psyche, Vol. 27, 1920. p. 23-34.  
A Comparison of the Genitalia of Male Hymenoptera, Mecoptera, Neuroptera, Diptera, Trichoptera, Lepidoptera, Homoptera and Strepsiptera, with those of lower insects. Psyche, Vol. 27, 1920. p. 34-46.
- DACY, ARTHUR L. Professor of Vegetable Gardening.  
Asparagus Growing in Massachusetts. In Massachusetts Agricultural College. Extension Service. Extension Bulletin No. 35, May, 1920. 10 p.

FARLEY, GEORGE L. Supervisor of Junior Extension Work.

Corn Club Primer, by Earl Jones, G. L. Farley and W. F. Howe. Massachusetts Agricultural College. Extension Service. Junior Extension Series No. 9, April, 1920. 4 p.

Junior Extension Account Books. Corn Club, Potato Club, and Garden Club. Massachusetts Agricultural College. Extension Service. Junior Extension Series No. 8, April, 1920. 3 vols.

Junior Extension Work. Massachusetts Agricultural College. Extension Service. Junior Extension Series No. 11, April, 1920. 7 p.

Potato Club Primer, by Earl Jones, G. L. Farley and W. F. Howe. Massachusetts Agricultural College. Extension Service. Junior Extension Series No. 10, April, 1920. 4 p.

FERNALD, HENRY T. Professor of Entomology.

Asparagus Insects. In Massachusetts Agricultural College. Extension Service. Extension Bulletin No. 35, May, 1920. p. 11, 12.

The European Corn Borer. In Nebraska Farmer, Vol. 62, No. 15, 1920. p. 1065.

Ten Years of the Oriental Moth. Journal of Economic Entomology, Vol. 13, No. 2, April, 1920. p. 210-212.

FRANKLIN, HENRY J. In Charge of Cranberry Investigations.

Cape Cod Cranberry Frosts. In United States Department of Agriculture. Monthly Weather Review, Supplement No. 16. p. 20-30.

GOODALE, HUBERT D. Research Professor of Poultry Husbandry.

Data concerning the Inheritance of Broodiness in the Rhode Island Red Breed of Domestic Fowl. Massachusetts Agricultural Experiment Station, Bulletin No. 199, November, 1920.

HASLETT, HENRY E. Specialist in Sheep Husbandry.

Care of Ewes during Fall and Winter. In County Farm Bureau Bulletins, December, 1919, and January, 1920.

Harvest Time for the Shepherd. In Berkshire Farmers' Bulletin, April, 1920. p. 1-4.

More Money in Docked and Castrated Lambs. In Berkshire Farmers' Bulletin, May, 1920. p. 11, 12.

HOWE, WILLIAM F. Assistant Supervisor in Junior Extension Work.

Corn Club Primer, by Earl Jones, G. L. Farley and W. F. Howe. Massachusetts Agricultural College. Extension Service. Junior Extension Series No. 9, April, 1920. 4 p.

Garden Primer, Massachusetts Boys' and Girls' Clubs. Massachusetts Agricultural College. Extension Service. Junior Extension Series No. 7, April, 1920. 15 p.

Potato Club Primer, by Earl Jones, G. L. Farley and W. F. Howe. Massachusetts Agricultural College. Extension Service. Junior Extension Series No. 10, April, 1920. 4 p.

JONES, EARL. Extension Professor of Agronomy.

Alfalfa and Soy Beans gain by its Use. In Hampshire County Farm Bureau Monthly, April, 1920. p. 5.

Corn Club Primer, by Earl Jones, G. L. Farley and W. F. Howe. Massachusetts Agricultural College. Extension Service. Junior Extension Series No. 9, April, 1920. 4 p.

Good Seed Corn. In Berkshire Farmers' Bulletin, September, 1920. p. 10.

Making Bordeaux Mixture. In County Farm Bureau Bulletins, July, 1920.

Plant Sweet Corn as Usual. In Berkshire Farmers' Bulletins, May, 1920. p. 10.

Potato Club Primer, by Earl Jones, G. L. Farley and W. F. Howe. Massachusetts Agricultural College. Extension Service. Junior Extension Series No. 10, April, 1920. 4 p.

Seed Corn Testing Low. In County Farm Bureau Bulletins, April, 1920.

Soil and Glue Method of Inoculating Legume Seed. In County Farm Bureau Bulletins, May and April, 1920.

Soy Beans for Silage. In Middlesex County Bulletin for May, 1920. p. 7.

Spraying Potatoes with Bordeaux will increase the Yield. In Bristol County Farmers' Bulletin, June, 1920. p. 2.

Weather prevents Drying. In Middlesex County Bulletin, December, 1919. p. 5.

What is the Analysis of the Fertilizers you are Buying? In County Farm Bureau Bulletins, March, 1920.

LINDSEY, JOSEPH B. Professor of Agricultural Chemistry.

The Nutritive Value of Cattle Feeds. I. Velvet Bean Feed for Farm Stock. Massachusetts Agricultural Experiment Station. Bulletin No. 197, September, 1920. p. 61-74.

The Nutritive Value of Cattle Feeds. II. Oat Feed for Farm Stock. Massachusetts Agricultural Experiment Station. Bulletin No. 200, November, 1920.

Semi-solid Buttermilk. In Berkshire Farmers' Bulletin, February, 1920. p. 9, 10.

LYONS, LOUIS M. Editor of Extension Publications.

M. A. C. at Eastern States Exposition. In New England Farms, Vol. 3, No. 41, Oct. 9, 1920. p. 3.

M. A. C. opens. In New England Farms, Vol. 3, No. 42, Oct. 16, 1920. p. 2, 3.

- MONAHAN, WILLIAM C. Extension Professor of Poultry Husbandry.  
 Breeding for Egg Production. In County Farm Bureau Bulletins, February, 1920.  
 Brooding Sanitation. In County Farm Bureau Bulletins, March, 1920.  
 Feeding Chicks. In Berkshire Farmers' Bulletin, April, 1920. p. 8, 9.  
 Lice, Mites and their Control. In County Farm Bureau Bulletins, July, 1920.  
 Poultry Feeding. Massachusetts Agricultural College. Extension Service. Extension Bulletin No. 33, December, 1919. 8 p.  
 Poultry Feeding. Massachusetts Agricultural College. Extension Service. Extension Bulletin No. 33 (2d ed.), July, 1920. 8 p.  
 Poultry Pointers. In Hampshire County Farm Bureau Monthly, May, 1920. p. 5-7.  
 Poultry Suggestions. In Bristol County Farmers' Bulletin, March, 1920. p. 4.  
 Round Worms in Poultry. In County Farm Bureau Bulletins, October, 1920.
- MORSE, FRED W. Research Professor of Chemistry.  
 A Fertilizer Experiment with Asparagus. Massachusetts Agricultural Experiment Station. Bulletin No. 194, December, 1919. p. 231-257.  
 Studies of Cranberries during Storage. Massachusetts Agricultural Experiment Station. Bulletin No. 198, September, 1920.
- NODINE, EARLE H. Extension Instructor in Charge of Poultry Club Work.  
 Brooding Methods are Very Important. In Middlesex County Bulletin, April, 1920. p. 13.  
 Many will want to Hatch "Chicks." In Middlesex County Bulletin, March, 1920. p. 12.  
 Overfeeding causes Loss of Many Chicks. In Middlesex County Bulletin, May, 1920. p. 13.  
 Primer of Instruction. Massachusetts Boys' and Girls' Poultry Clubs. Massachusetts Agricultural College. Extension Service. Boys' and Girls' Series, No. 11, May, 1920. 9 p.
- NORRIS, HELEN M. Extension Instructor in Agricultural Education.  
 Every Girl should try to Look Nice. In Middlesex County Bulletin, March, 1920. p. 13.  
 Massachusetts Junior Extension Canning Club Bulletin. Massachusetts Agricultural College. Extension Service. Junior Extension Series No. 12, June, 1920. 14 p.
- RAND, FRANK P. Instructor in English.  
 Editorials in The Signet, December, 1919, March, June and September, 1920. The Golden Rule and College Fraternities. In Banta's Greek Exchange, Vol. 8, No. 3, July, 1920. p. 311-314.
- REGAN, W. S. Assistant Professor of Entomology.  
 Progress in the Use of Chemicals for Destroying Rives. In American Plant Pest Commission Report, 1920.
- SEARS, FRED C. Professor of Pomology.  
 Grape Growing in Massachusetts. Massachusetts Agricultural College. Extension Service. Extension Bulletin No. 32, February, 1920. 25 p.  
 Productive Small Fruit Culture. Philadelphia. Lippincott, 1920. 368 p.  
 Spraying the Apple Orchards. Massachusetts Agricultural College. Extension Service. Extension Bulletin No. 34, May, 1920. 8 p.
- SIMS, NEWELL L. Professor of Rural Sociology.  
 The Rural Community, Ancient and Modern. New York. Scribner, 1920. 916 p.  
 Rural Socialization. In Political Science Quarterly, Vol. 35, No. 1, March, 1920.
- SMITH, PHILIP H. Chemist in Charge of Feed and Dairy Section.  
 Inspection of Commercial Feed Stuffs, 1920. Massachusetts Agricultural Experiment Station. Control Series No. 13, November, 1920.
- STRAHAN, JAMES L. Assistant Professor of Rural Engineering.  
 Framing of Large Barns. In Builders' Journal, October, 1920.
- TOMPSON, HAROLD F. Professor of Vegetable Gardening.  
 New England Notes in Market Growers' Journal, December, 1919-November, 1920.  
 Functions of its Work are Three in Number. In Middlesex County Bulletin, April, 1920. p. 10.  
 The Home Vegetable Garden. In County Farm Bureau Bulletins, May and June, 1920.  
 Market Garden Notes. In Berkshire Farmers' Bulletin, May and June, 1920.  
 Market Gardeners' Field Trip. In Bristol County Farmers' Bulletin, June, 1920. p. 4.  
 Seed Buying and Seed Testing. In County Farm Bureau Bulletins, February and March, 1920.
- VAN METER, RALPH A. Assistant Extension Professor of Pomology.  
 Care of Bridge-grafted Trees. In County Farm Bureau Bulletins, June and October, 1920.  
 Many Orchards need Fertilization. In Berkshire Farmers' Bulletin, June, 1920. p. 5.  
 Protect Fruit Trees from Mice. In Bristol County Farmers' Bulletin, October, 1920. p. 4.  
 Spray Your Apple Trees. In Berkshire Farmers' Bulletin, April, 1920. p. 6, 7.

WAUGH, FRANK A. Professor of Landscape Gardening.

Apple Butter. In *Country Gentleman*, Vol. 84, No. 47, Dec. 6, 1919, p. 67.

The Game. In *Country Gentleman*, Vol. 85, No. 42, Oct. 16, 1920. p. 32.

Going! Going! Almost gone! In *Country Gentleman*, Vol. 85, No. 18, May 1, 1920. p. 6, 54.

How Many Apple Trees? In *Country Gentleman*, Vol. 85, No. 27, July 3, 1920. p. 12, 34.

Occupational Therapy in Tuberculosis. Typewritten volume, 1919, photos. 41 p.

Occupational Therapy in Tuberculosis. In *Scientific Monthly*, Vol. 10, No. 5, May, 1920. p. 438-456.

The Opportunities of the Country Village. In *House Beautiful*, Vol. 48, No. 4, October, 1920. p. 276, 277, 312.

Recreational Forestry. In *The Playground*, Vol. 14, No. 4, July, 1920. p. 219-225.

A Restudy of Plans for the College Grounds and for the Location of Buildings. 1920. 37 p.

Seven Mountains of Massachusetts. In *Springfield Republican*, Feb. 1, 1920.

A Side Line of Fruit: How You can make it Pay on Your Farm. In *Farm and Fireside*, Vol. 44, No. 1, January, 1920. p. 17, 56.

Those Dear Old Whims. In *Country Gentleman*, Vol. 85, No. 20, May 15, 1920. p. 13, 58.

The Tree Planter's Problem. In *Country Gentleman*, Vol. 85, No. 16, April 17, 1920. p. 6, 58.

Useful Landscape Gardening on the Farm. In *Farmers' Advocate*, Vol. 54, December, 1919. p. 2218.

What We do in the Country — Music. In *Country Gentleman*, Vol. 84, No. 50, Dec. 13, 1919. p. 15, 32.

Where shall We Ride To-day? In *Springfield Republican*, April 18, 1920.

## REPORT OF THE TREASURER

FOR THE FISCAL YEAR ENDING NOV. 30, 1920.

## BALANCE SHEET.

	Dr.	Cr.
<b>1919</b>		
Dec. 1. To balance on hand, . . . . .	\$30,442 21	
<b>1920</b>		
Nov. 30. To departmental income, . . . . .	151,201 82	
Nov. 30. To receipts from State Treasurer, . . . . .	772,665 70	
Nov. 30. To November, 1919, schedule, . . . . .	66,413 37	
Nov. 30. To refunds to State Treasurer, . . . . .	32 60	
Nov. 30. To receipts from United States Treasurer, . . . . .	122,541 26	
Nov. 30. To September and October schedule in transit, . . . . .	16,990 50	
Nov. 30. To November schedule in transit, . . . . .	99,195 06	
Nov. 30. Expenditures of November, 1919, schedule paid in this fiscal year, . . . . .		\$66,413 37
Nov. 30. Refunds transferred to State Treasurer, . . . . .		32 60
Nov. 30. Expenditure for fiscal year, . . . . .		1,004,514 74
Nov. 30. Income transferred to State Treasurer, . . . . .		151,201 82
Nov. 30. Balance on hand, . . . . .		37,319 99
	\$1,259,482 52	\$1,259,482 52

## STATEMENT OF LEGISLATIVE APPORTIONMENT AND EXPENDITURES FOR FISCAL YEAR ENDING NOV. 30, 1920, AND APPORTIONMENT REQUESTED FOR 1921.

	Apportionment for Last Fiscal Year.	Expenditures.	Requested Apportionment for New Fiscal Year.
<b>College: —</b>			
Personal services, . . . . .	\$305,361 21	\$298,075 47	\$426,437 00
Maintenance, . . . . .	209,270 16	229,072 09	269,430 00
	\$514,631 37	\$527,147 56	\$695,867 00
<b>Experiment Station: —</b>			
Personal services, . . . . .	\$41,000 00	\$43,060 36	\$111,481 00
Maintenance, . . . . .	15,816 69	17,303 71	25,280 00
	56,816 69	60,364 07	136,761 00
<b>Extension Service: —</b>			
Personal services, . . . . .	\$54,005 60	\$48,371 91	\$121,530 00
Maintenance, . . . . .	40,976 28	36,416 55	67,200 00
	94,981 88	84,788 46	188,730 00
<b>Short Courses: —</b>			
Personal services, . . . . .	\$25,600 00	\$27,306 65	\$45,133 00
Maintenance, . . . . .	14,056 45	7,940 56	20,275 00
	39,656 45	35,247 21	65,408 00
<b>Market-Garden and Field Station: —</b>			
Personal services, . . . . .	\$5,400 00	\$5,277 29	\$6,000 00
Maintenance, . . . . .	3,050 12	2,680 21	3,000 00
	8,450 12	7,957 50	9,000 00
<b>Totals, . . . . .</b>	<b>\$714,536 51</b>	<b>\$715,504 80</b>	<b>\$1,095,766 00</b>

STATEMENT OF LEGISLATIVE APPORTIONMENT AND EXPENDITURES FOR  
FISCAL YEAR ENDING NOV. 30, 1920, AND APPORTIONMENT RE-  
QUESTED FOR 1921 — *Concluded.*

	Apportionment for Last Fiscal Year.	Expenditures.	Requested Apportionment for New Fiscal Year.
Trustees, travel, . . .	\$1,334 86	\$798 39	\$1,200 00
Printing reports, . . .	5,500 00	1,641 27	5,500 00
Commercial feedstuffs, . .	6,017 00	5,767 91	8,000 00
Totals, . . .	\$727,388 37	\$723,712 37	\$1,110,466 00
Fertilizer law, . . .	12,583 93	12,410 84	14,500 00
Poultry disease law, . . .	3,263 28	3,064 98	6,000 00
Milk testing law, . . .	550 00	525 08	600 00
Totals, . . .	\$743,785 58	\$739,713 27	\$1,131,566 00
Balance unexpended, . . .	-	4,072 31	-
	-	\$743,785 58	-

CASH STATEMENT.

	Other Funds.	State Funds.	Totals.
Balance Dec. 1, 1919, . . . . .	\$30,442 21	-	\$30,442 21
<i>Receipts.</i>			
College receipts from students and others, . . . . .	-	-	\$15,055 63
Tuition, . . . . .	-	\$3,045 00	
Laboratory fees, . . . . .	-	6,435 13	
Rents, . . . . .	-	5,575 50	
Department sales, . . . . .	-	-	101,491 12
Produce, . . . . .	-	97,292 03	
Miscellaneous, . . . . .	-	4,199 09	
Experiment Station, . . . . .	-	-	8,044 81
Cranberry receipts, . . . . .	-	3,912 35	
Chemical receipts, . . . . .	-	2,425 11	
Miscellaneous, . . . . .	-	1,707 35	
Extension Service, . . . . .	-	-	2,537 39
Correspondence Courses, . . . . .	-	643 00	
Miscellaneous, . . . . .	-	1,894 39	
Short Courses, . . . . .	-	-	4,810 25
Students' fees, . . . . .	-	4,353 50	
Summer School, . . . . .	-	31 75	
Winter School, . . . . .	-	425 00	
Market-Garden Field Station, . . . . .	-	-	2,286 34
Produce, . . . . .	-	2,286 34	
Fertilizer law, . . . . .	-	14,798 17	14,798 17
Milk testing law, . . . . .	-	709 93	709 93
Poultry disease law, . . . . .	-	1,468 18	1,468 18
Treasurer of the Commonwealth, . . . . .	-	-	772,665 70
Maintenance, . . . . .	-	628,031 46	
Special appropriations, . . . . .	-	141,320 92	
Endowment, . . . . .	\$3,313 32	-	

CASH STATEMENT — *Concluded.*

	Other Funds.	State Funds.	Totals.
<i>Receipts—Concluded.</i>			
Federal government, . . . . .			\$122,541 26
Land grant of 1862, . . . . .	\$7,300 00	—	
Hatch fund of 1887, . . . . .	15,000 00	—	
Morrill fund of 1890, . . . . .	16,666 67	—	
Adams fund of 1906, . . . . .	15,000 00	—	
Nelson fund of 1907, . . . . .	16,666 66	—	
Smith-Lever fund of 1914, . . . . .	31,247 93	—	
Short Course, unit, . . . . .	8,160 00	—	
Short Course, two years, . . . . .	12,500 00	—	
November, September and October schedules in transit.	—	\$116,185 56	116,185 56
	\$156,296 79	\$1,036,739 76	\$1,193,036 55
<i>Payments.</i>			
College expenses, . . . . .			\$567,240 59
Personal services, . . . . .	\$40,055 13	\$298,075 47	
Maintenance, . . . . .	37 90	229,072 09	
Experiment Station, . . . . .			90,340 53
Personal services, . . . . .	29,760 24	43,060 36	
Maintenance, . . . . .	216 22	17,303 71	
Extension Services, . . . . .			113,811 81
Personal services, . . . . .	26,531 51	48,371 91	
Maintenance, . . . . .	2,491 84	36,416 55	
Short Courses, . . . . .			55,131 17
Personal services, . . . . .	15,979 84	27,306 65	
Maintenance, . . . . .	3,904 12	7,940 56	
Market-Garden Field Station, . . . . .			7,957 50
Personal services, . . . . .	—	5,277 29	
Maintenance, . . . . .	—	2,680 21	
Trustees, travels, . . . . .	—	798 39	798 39
Printing reports, . . . . .	—	1,641 27	1,641 27
Commercial feedstuffs, . . . . .	—	5,767 91	5,767 91
Fertilizer law, . . . . .	—	12,410 84	12,410 84
Poultry disease law, . . . . .	—	3,064 98	3,064 98
Milk testing law, . . . . .	—	525 08	525 08
Special appropriations, . . . . .			145,824 67
1917, improvements power plant, . . . . .	—	32 25	
1918, Market-Garden Field Station, . . . . .	—	3,426 61	
1918, dining hall, . . . . .	—	312 40	
1919, improvements and equipments, . . . . .	—	9,541 74	
1919, women's dormitory, . . . . .	—	100,219 74	
1919, Market-Garden Field Station, . . . . .	—	5,056 22	
1919, Engineering survey, . . . . .	—	1,104 91	
1920, Improvements and equipments, . . . . .	—	24,847 41	
1920, Cavalry barn, . . . . .	—	1,283 39	
Income, . . . . .	—	151,201 82	151,201 82
Balance, . . . . .	37,319 99	—	37,319 99
	\$156,296 79	\$1,036,739 76	\$1,193,036 55



## CLASSIFICATION OF INCOME FROM STUDENTS AND OTHERS.

	Laboratory Department Fees.	Sales.	Rent.	Miscellaneous.	Tuition.	Totals.
Agronomy, . . . .	\$212 50	- -	-	\$0 45	-	\$212 95
Animal husbandry, . .	342 00	-	-	-	-	342 00
Beekeeping, . . . .	-	\$145 85	-	-	-	145 85
Botany, . . . .	497 00	-	-	-	-	497 00
Chemistry, . . . .	2,491 39	8 30	-	-	-	2,499 69
Dairying, . . . .	321 00	29,484 99	-	-	-	29,805 99
Entomology, . . . .	113 00	-	\$18 00	-	-	131 00
Farm, . . . .	-	41,367 75	-	232 06	-	41,599 81
Farm management, . .	172 50	-	-	-	-	172 50
Floriculture, . . . .	131 50	5,399 30	-	-	-	5,530 80
Forestry, . . . .	12 00	-	-	-	-	12 00
General horticulture, .	-	-	-	843 26	-	843 26
Grounds, . . . .	-	-	-	22 30	-	22 30
Horticultural manufactures.	-	601 15	-	-	-	601 15
Hospital, . . . .	-	-	-	758 92	-	758 92
Landscape gardening, .	386 00	-	-	-	-	386 00
Language and literature.	202 00	-	-	-	-	202 00
Library, . . . .	-	31 94	-	3 00	-	34 94
Market gardening, . .	59 50	3,036 75	-	-	-	3,096 25
Mathematics, . . . .	84 00	-	-	-	-	84 00
Microbiology, . . . .	232 88	-	-	257 50	-	540 38
Military, . . . .	-	-	-	12 28	-	12 28
Mount Toby, . . . .	-	585 11	-	-	-	585 11
Physics, . . . .	90 00	-	-	3 85	-	93 85
Pomology, . . . .	92 00	3,911 45	-	-	-	4,003 45
Poultry husbandry, . .	56 00	9,299 08	-	-	-	9,355 08
Rural engineering, . .	262 50	-	-	-	-	262 50
Veterinary, . . . .	24 00	-	-	1 28	-	25 28
Zoölogy and geology, .	385 00	-	-	-	-	385 00
Operating and maintenance.	-	-	-	3,549 98	\$3,045 00	6,594 98
General expense (cash credits).	-	-	-	1,453 61	-	1,453 61
Adams Hall, . . . .	-	-	672 00	-	-	672 00
Draper Hall, . . . .	-	-	1,221 50	-	-	1,221 50
North dormitory, . .	-	-	2,181 50	-	-	2,181 50
South dormitory, . .	-	-	1,520 00	-	-	1,520 00

CLASSIFICATION OF INCOME FROM STUDENTS AND OTHERS — *Concluded.*

	Laboratory Department Fees.	Sales.	Rent.	Miscellaneous.	Tuition.	Totals.
College residences, .	—	—	\$571 56	—	—	\$571 56
President's office, .	—	—	—	\$25 29	—	25 29
Registrar's office, .	—	—	—	15	—	15
Treasurer's office, .	—	—	—	76 08	—	76 08
Totals, . . .	\$6,216 77	\$93,871 67	\$6,184 56	\$7,240 01	\$3,045 00	\$116,558 01
Less refunds, . .	—	8 26	—	3 00	—	11 26
Totals, . . .	\$6,216 77	\$93,863 41	\$6,184 56	\$7,237 01	\$3,045 00	\$116,546 75

## ANALYSIS OF COLLEGE EXPENDITURES.

ADMINISTRATION.	Office Expense.	Salaries and Labor.	Travel.	Minor Equipment.	Building Supplies.	Publicity and Lectures.	Student Activities.	Comme-ment.	Miscellaneous.	Totals.
Dean's office, . . . . .	\$341 14	\$258 63	-	\$3 68	-	-	-	-	-	\$603 45
Executive order, . . . . .	-	-	\$2,453 96	-	-	\$2,833 66	\$228 26	\$1,060 47	\$4,260 27	10,841 62
President's office, . . . . .	1,928 72	122 63	205 90	29 16	\$11 95	-	-	-	25 64	2,324 00
Registrar's office, . . . . .	647 60	75 90	70 20	4 13	-	-	-	-	-	707 83
Treasurer's office, . . . . .	900 32	614 89	179 04	125 73	54 77	-	-	-	69 41	1,943 66
Administration (salaries), . . . . .	-	38,082 71	-	-	-	-	-	-	-	38,082 71
Totals, . . . . .	\$3,817 78	\$39,154 26	\$2,914 10	\$162 70	\$66 72	\$2,833 66	\$228 26	\$1,060 47	\$4,355 32	\$54,593 27

MAINTENANCE.	Office Expense.	Labor.	Laboratory Supplies.	Minor Equipment.	Building Supplies.	Travel.	General Expense.	Miscellaneous.	Salaries.	Totals.
Academic maintenance: —										
Agricultural economies, . . . . .	\$181 86	\$95 82	\$35 03	\$65 11	\$6 33	\$124 48	-	-	-	\$508 63
Agricultural education, . . . . .	204 97	-	41 53	57 33	-	76 74	-	\$81 09	-	461 66
Agronomy, . . . . .	192 56	261 00	418 78	155 29	-	125 11	-	-	-	1,152 74
Animal husbandry, . . . . .	254 72	180 10	28 02	26 87	-	211 32	-	-	-	701 03
Beekeeping, . . . . .	-	473 60	2 65	3 59	2 73	-	-	-	-	482 57
Botany, . . . . .	212 65	663 86	620 68	3 00	95 16	21 67	-	-	-	1,617 02

ANALYSIS OF COLLEGE EXPENDITURES — *Concluded.*

MAINTENANCE.		Office Expense.	Labor.	Laboratory Supplies.	Minor Equip- ment.	Building Supplies.	Travel.	General Expense.	Miscel- laneous.	Salaries.	Totals.
Chemistry,	.	\$131 46	\$1,031 59	\$3,735 65	\$46 51	\$76 71	\$8 90	-	-	-	\$5,030 82
Dairying,	.	293 75	4,681 48	33,319 80	413 61	391 68	63 90	-	\$0 52	-	39,164 74
Domestic science,	.	477 70	240 83	741 63	56 64	12 30	203 85	-	-	-	1,822 95
Economics and sociology,	.	26 97	14 75	-	-	10 81	-	-	18 90	-	71 43
Entomology,	.	104 54	301 85	54 66	45 60	98 49	-	-	-	-	605 14
Farm management,	.	176 34	124 73	86 01	88 28	-	113 40	-	-	-	588 76
Floriculture,	.	79 76	5,801 98	999 88	91 61	29 04	15 28	-	7 00	-	7,024 55
Forestry,	.	25 99	81 00	7 40	11 34	4 98	33 33	-	1 04	-	165 08
General agriculture,	.	-	1,844 14	-	223 76	258 41	-	-	71 77	-	2,398 08
Horticultural manufactures,	.	79 86	1,240 73	1,805 91	148 94	-	25 92	-	10 00	-	3,311 36
Hospital,	.	-	1,760 82	-	20 60	-	-	\$1,339 86	-	-	3,121 28
Landscape gardening,	.	62 84	4 80	347 91	-	-	25 09	-	38 78	-	479 42
Language and literature,	.	10 08	80 39	80 11	124 80	-	30 28	-	30 00	-	355 66
Market gardening,	.	156 00	4,203 03	1,296 87	35 71	36 47	255 14	-	35 00	-	6,018 22
Mathematics,	.	73 75	105 27	6 43	1 73	13 18	-	-	-	-	200 36
Microbiology,	.	96 04	595 77	594 37	121 96	40 13	-	-	-	-	1,448 27
Military science,	.	173 44	446 95	43	411 05	100 84	-	124 24	39 88	-	1,296 83
Mount Toby,	.	-	327 91	-	9 83	-	13 04	-	42 70	-	393 48
Physical education,	.	113 60	490 39	164 24	-	30 08	327 41	-	-	-	1,125 72
Physics,	.	9 80	369 10	246 03	24 25	12 43	-	-	-	-	661 61
Pomology,	.	281 54	4,858 07	685 91	66 43	-	44 93	-	5 00	-	5,941 88

[illegible]

## CURRENT ACCOUNTS, 1920.

*Disbursements and Receipts.*

ACCOUNTS.	Disbursements from Nov. 30, 1919, to Nov. 30, 1920.	Receipts from Nov. 30, 1919, to Nov. 30, 1920.	Apportionment for Year ending Nov. 30, 1920.	Balance to Credit.
Administration:—				
Dean's office, . . . . .	\$603 45	—	\$600 00	—\$3 45
Executive order, . . . . .	10,841 62	—	10,675 00	—166 62
President's office, . . . . .	2,324 00	\$25 29	1,600 00	—724 00
Registrar's office, . . . . .	797 83	15	600 00	—197 83
Salaries, . . . . .	38,082 71	—	38,000 00	—82 71
Treasurer's office, . . . . .	1,943 66	76 08	1,300 00	—643 66
Maintenance, academic:—				
Agricultural economics, . . . . .	508 63	—	550 00	41 37
Agricultural education, . . . . .	461 66	—	600 00	138 34
Agronomy, . . . . .	1,152 74	212 95	1,100 00	—52 74
Animal husbandry, . . . . .	701 03	342 00	700 00	—1 03
Beekeeping, . . . . .	482 57	145 85	1,185 00	702 43
Botany, . . . . .	1,617 02	497 00	1,750 00	132 98
Chemistry, . . . . .	5,030 82	2,499 69	5,200 00	169 18
Dairying, . . . . .	39,164 74	29,805 99	39,850 00	685 26
Domestic science, . . . . .	1,822 95	—	1,500 00	—322 95
Economics and sociology, . . . . .	71 43	—	50 00	—21 43
Entomology, . . . . .	605 14	131 00	815 00	209 86
Farm management, . . . . .	588 76	172 50	500 00	—88 76
Floriculture, . . . . .	7,024 55	5,530 80	7,550 00	525 45
Forestry, . . . . .	165 08	12 00	250 00	84 92
General agriculture, . . . . .	2,398 08	—	2,100 00	—298 08
Horticultural manufactures, . . . . .	3,311 36	601 15	3,000 00	—311 36
Hospital, . . . . .	3,121 28	758 92	2,000 00	—1,121 28
Landscape gardening, . . . . .	479 42	386 00	500 00	20 58
Language and literature, . . . . .	355 66	202 00	400 00	44 34
Market gardening, . . . . .	6,018 22	3,096 25	6,500 00	481 78
Mathematics, . . . . .	200 36	84 00	285 00	84 64
Microbiology, . . . . .	1,448 27	540 38	2,100 00	651 73
Military science, . . . . .	1,296 83	12 28	2,000 00	703 17
Mount Toby, . . . . .	393 48	585 11	3,000 00	2,606 52
Physical education, . . . . .	1,125 72	—	800 00	—325 72
Physics, . . . . .	661 61	93 85	720 00	58 39
Pomology, . . . . .	5,941 88	4,003 45	4,775 00	—1,166 88
Poultry husbandry, . . . . .	13,638 17	9,355 08	15,500 00	1,861 83
Rural engineering, . . . . .	639 11	262 50	600 00	—39 11
Rural sociology, . . . . .	88 35	—	125 00	36 65
Veterinary, . . . . .	1,456 27	25 28	1,300 00	—156 27
Zoölogy and geology, . . . . .	592 79	385 00	575 00	—17 79
Maintenance, general:—				
Farm, . . . . .	61,369 34	41,599 81	48,500 00	—12,869 34
General horticulture, . . . . .	8,742 43	843 26	10,000 00	1,257 57
Graduate school, . . . . .	51 40	—	100 00	48 60
Grounds, . . . . .	7,486 07	22 30	7,500 00	13 93
Library, . . . . .	7,700 67	34 94	6,500 00	—1,200 67
General expense, . . . . .	1,453 61	1,453 61	—	—
Operating and maintenance, . . . . .	130,943 01	12,761 54	104,000 00	—26,943 01
Endowment fund, . . . . .	7,350 53	10,613 32	10,613 32	6,655 35
Instruction:—				
Salaries, . . . . .	149,319 85	—	159,000 00	9,680 15
United States Treasurer, Morrill fund, . . . . .	16,371 24	16,666 67	16,666 67	10,088 90
United States Treasurer, Nelson fund, . . . . .	16,371 26	16,666 66	16,666 66	10,088 88
State Treasurer, account of schedules, . . . . .	—	527,147 56*	—	—
Income to State Treasurer, . . . . .	116,546 75	—	—	—
	\$680,863 41	\$687,652 22	\$540,201 65	\$318 11
*Less amount transferred from Experiment Station, . . . . .	—	2,935 19*	—	—
	\$680,863 41	\$684,717 03	—	—
Less refunds, . . . . .	11 26	11 26	—	—
	\$680,852 15	\$684,705 77	—	—
Balance beginning fiscal year Dec. 1, 1919, . . . . .	—	22,979 51	—	—
Balance on hand Nov. 30, 1920, . . . . .	26,833 13	—	—	—
	\$707,685 28	\$707,685 28	—	—

## COLLEGE ACCOUNTS.

*Comparative Disbursements and Receipts for 1919-20.*

ACCOUNTS.	DISBURSEMENTS.		RECEIPTS.	
	1919.	1920.	1919.	1920.
Agricultural economics, . . . . .	\$377 98	\$508 63	\$1 22	-
Agricultural education, . . . . .	264 25	461 66	10	-
Agronomy, . . . . .	947 94	1,152 74	252 00	\$212 95
Animal husbandry, . . . . .	742 75	701 03	294 20	342 00
Beekeeping, . . . . .	-	482 57	-	145 85
Botany, . . . . .	1,482 78	1,617 02	627 76	497 00
Chemistry, . . . . .	4,636 62	5,030 82	2,669 42	2,499 69
Dairying, . . . . .	33,550 70	39,164 74	33,301 94	29,805 99
Dean's office, . . . . .	522 50	603 45	55	-
Domestic science, . . . . .	2,397 27	1,822 95	68	-
Economics and sociology, . . . . .	65 78	71 43	-	-
Entomology, . . . . .	943 87	605 14	1,082 50	131 00
Executive order, . . . . .	7,085 23	10,841 62	-	-
Farm, . . . . .	50,997 36	61,369 34	44,238 47	41,599 81
Farm management, . . . . .	358 32	588 76	195 60	172 50
Floriculture, . . . . .	7,468 40	7,024 55	4,549 99	5,530 80
Forestry, . . . . .	337 79	165 08	9 00	12 00
Freshman agriculture, . . . . .	188 60	-	219 00	-
General agriculture, . . . . .	2,001 15	2,398 08	4 15	-
Graduate school, . . . . .	60 26	51 40	-	-
General horticulture, . . . . .	9,117 97	8,742 43	2,248 26	342 26
Grounds, . . . . .	5,731 00	7,486 07	107 13	22 30
Horticultural manufactures, . . . . .	3,429 13	3,311 36	641 03	601 15
Hospitals, . . . . .	2,212 25	3,121 28	792 48	758 92
Landscape gardening, . . . . .	169 44	479 42	248 24	386 00
Language and literature, . . . . .	210 06	355 66	170 00	202 00
Library, . . . . .	6,919 64	7,700 67	59 34	34 94
Market gardening, . . . . .	7,892 42	6,018 22	4,804 51	3,096 25
Mathematics, . . . . .	220 86	200 36	232 81	84 00
Military, . . . . .	1,387 77	1,296 83	-	12 28
Microbiology, . . . . .	1,825 90	1,448 27	704 60	540 38
Mount Toby, . . . . .	3,372 34	393 48	5,872 15	585 11
Physical education, . . . . .	841 27	1,125 72	-	-
Physics, . . . . .	722 24	661 61	40 05	93 85
Pomology, . . . . .	4,550 18	5,941 88	3,738 61	4,003 45
Poultry husbandry, . . . . .	16,248 47	13,638 17	15,895 74	9,355 08
President's office, . . . . .	1,971 58	2,324 00	3 50	25 29
Registrar's office, . . . . .	600 58	797 83	25	15
Rural engineering, . . . . .	742 47	639 11	214 14	262 50
Rural sociology, . . . . .	174 96	88 35	-	-
Salaries, . . . . .	153,261 35	187,402 56	-	-
Treasurer's office, . . . . .	1,540 22	1,943 66	64 55	76 08
Veterinary science, . . . . .	895 21	1,456 27	6 00	25 28
War emergency, . . . . .	102 62	-	844 62	-
Zoölogy and geology, . . . . .	655 34	592 79	516 13	385 00
General expense, . . . . .	31,350 07	1,453 61	31,350 07	1,453 61
Operating and maintenance, . . . . .	98,123 29	130,948 01	13,527 63	12,761 54
State Treasurer: —	-	-	-	-
Endowment fund, . . . . .	7,220 76	7,350 53	10,613 32	10,613 32
Graduate school, . . . . .	-	-	-	-
Maintenance, . . . . .	-	-	-	-
Instruction, . . . . .	-	-	-	-
Administration, . . . . .	-	-	-	-
United States Treasurer: —	-	-	-	-
Morrill fund, . . . . .	16,777 42	16,371 24	16,848 67	16,666 67
Nelson fund, . . . . .	16,777 40	16,371 26	16,848 66	16,666 66
State Treasurer account of schedules, . . . . .	-	-	427,244 04	527,147 56
Income to State Treasurer, . . . . .	128,673 20	116,546 75	-	-
	\$638,146 96	\$680,863 41	\$641,083 11	\$687,652 22
Less journal entries and refunds, . . . . .	41,454 14	11 26	40,855 22	11 26
	\$596,692 82	\$680,852 15	\$600,227 89	\$687,640 96
Less amount transferred from Experiment Station, . . . . .	-	-	-	2,935 19
	\$596,692 82	\$680,852 15	\$600,227 89	\$684,705 77
Balance beginning of fiscal year, . . . . .	-	-	19,444 44	22,979 51
Balance on hand at close of fiscal year, . . . . .	22,979 51	26,833 13	-	-
	\$619,672 33	\$707,685 28	\$619,672 33	\$707,685 28

COLLEGE ACCOUNTS — *Concluded.**Summary.*

	Disbursements.	Receipts.
Cash on hand Dec. 1, 1919, . . . . .	—	\$22,979 51
Institution receipts Nov. 30, 1920, . . . . .	—	116,546 75
State Treasurer's receipts Nov. 30, 1920, . . . . .	—	524,212 37 <sup>1</sup>
United States Treasurer's receipts Nov. 30, 1920, . . . . .	—	33,333 33
State Treasurer, endowment fund, . . . . .	—	10,613 32
Total disbursements, . . . . .	\$564,305 40	—
Receipts turned in to State Treasurer, . . . . .	116,546 75	—
	\$680,852 15	\$707,685 28
Bills receivable Dec. 1, 1919, deducted, . . . . .	—	8,206 00
Bills payable Dec. 1, 1919, deducted, . . . . .	7,179 90	—
	\$673,672 25	\$699,479 28
Bills receivable Nov. 30, 1920, . . . . .	—	8,773 84
Bills payable Nov. 30, 1920, . . . . .	1,785 17	—
Balance, . . . . .	32,755 70	—
	\$708,213 12	\$708,213 12

<sup>1</sup> Less amount transferred from Experiment Station, \$2,935.19.



## FARM DISBURSEMENTS.

	Labor.	Equip- ment.	Feed.	Supplies.	Sundry.	Bedding.	Fertilizer.	Seeds.	Improve- ments.	Totals.
Dairy cattle,	\$10,352 47	\$1,415 06	\$2,890 94	\$3,108 62	\$916 01	-	-	-	-	\$18,683 10
Sheep,	1,405 81	239 21	-	7 80	201 73	-	-	-	-	1,864 55
Horses,	1,599 46	117 89	11 30	48 79	309 57	-	-	-	-	2,087 01
Live stock,	419 38	-	16,383 66	-	-	\$1,941 88	-	-	-	18,744 90
Swine,	1,238 09	91 13	1,838 39	5 90	68 17	-	-	-	-	3,241 68
Field crops,	6,167 22	-	-	46 73	-	-	\$1,224 73	\$489 47	-	7,928 15
Tools and machinery,	3,501 06	1,090 81	-	492 53	-	-	-	-	-	2,084 40
Miscellaneous,	3,962 40	-	-	293 03	112 85	-	-	-	\$2,367 27	6,735 55
Totals,	\$25,645 87	\$2,954 10	\$21,124 29	\$4,013 40	\$1,608 33	\$1,941 88	\$1,224 73	\$489 47	\$2,367 27	\$61,369 34

## FARM CREDITS.

	Milk.	Stock.	Sundry.	Labor.	Field Crops.	Tools and Machinery.	Improve- ments.	Totals.
Dairy cattle,	\$32,210 77	\$2,783 07	\$41 70	-	-	-	-	\$35,035 54
Horses,	-	-	35 00	\$81 41	-	-	-	116 41
Sheep,	-	185 00	132 00	-	-	-	-	337 00
Live stock,	-	-	22 00	-	-	-	-	22 00
Swine,	-	2,081 88	-	-	-	-	-	2,081 88
Field crops,	-	-	-	-	\$3,762 33	-	-	3,762 33
Tools and machinery,	-	-	-	-	-	\$12 00	-	12 00
Miscellaneous,	-	-	-	150 65	-	-	\$82 00	232 65
Totals,	\$32,210 77	\$5,049 95	\$250 70	\$232 06	\$3,762 33	\$12 00	\$82 00	\$41,599 81

AGRICULTURAL DIVISION.  
*Disbursements and Receipts.*

	Disbursements.	Receipts.
Agronomy, . . . . .	\$1,152 74	\$212 95
Animal husbandry, . . . . .	701 03	342 00
Dairying, . . . . .	39,164 74	29,805 99
Farm, . . . . .	61,369 34	41,599 81
Farm management, . . . . .	588 76	172 50
Poultry husbandry, . . . . .	13,638 17	9,355 08
Rural engineering, . . . . .	639 11	262 50
Division totals, . . . . .	\$117,253 89	\$81,750 83

*Summary.*

	Dr.	Cr.
By total division receipts, . . . . .		\$81,750 83
By bills receivable, . . . . .		6,958 87
By net apportionment, . . . . .		24,999 17
To total disbursements, . . . . .	\$117,253 89	
To bills payable, . . . . .	591 31	
Balance, . . . . .		4,136 33
	\$117,845 20	\$117,845 20

*Inventory of Quick Assets.*

	Nov. 30, 1919.	Nov. 30, 1920.
Inventory of produce, . . . . .	\$14,967 85	\$13,663 93
Inventory of cattle, . . . . .	17,090 00	17,850 00
Inventory of swine, . . . . .	1,507 00	1,171 00
Inventory of horses, . . . . .	4,350 00	3,650 00
Inventory of poultry, . . . . .	2,946 10	2,467 50
Inventory of sheep, . . . . .	2,010 00	2,885 00
	\$42,870 95	\$41,687 43

HORTICULTURAL DIVISION.  
*Disbursements and Receipts.*

	Disbursements.	Receipts.
Floriculture, . . . . .	\$7,024 55	\$5,530 80
General horticulture, . . . . .	8,742 43	843 26
Forestry, . . . . .	165 08	12 00
Grounds, . . . . .	7,486 07	22 30
Horticultural manufactures, . . . . .	3,311 36	601 15
Landscape gardening, . . . . .	479 42	386 00
Market gardening, . . . . .	6,018 22	3,096 25
Pomology, . . . . .	5,941 88	4,003 45
Mount Toby, . . . . .	393 48	585 11
Division totals, . . . . .	\$39,562 49	\$15,080 32

*Summary.*

	DR.	CR.
By total division receipts, . . . . .		\$15,080 32
By bills receivable, . . . . .		1,496 62
By net apportionment, . . . . .		27,994 68
To total division disbursements, . . . . .	\$39,562 49	
To bills payable, . . . . .	33 34	
By balance, . . . . .	4,975 79	
	\$44,571 62	\$44,571 62

*Inventory of Quick Assets.*

	Nov. 30, 1919.	Nov. 30, 1920.
Floriculture, . . . . .	\$1,200 00	\$1,500 00
General horticulture (live stock), . . . . .	1,995 00	1,855 00
Horticultural manufactures, . . . . .	200 00	150 00
Market gardening, . . . . .	175 50	85 00
Mount Toby, . . . . .	4,790 22	4,050 00
Pomology, . . . . .	455 00	1,350 00
	\$8,815 72	\$8,990 00

## EXPENSE OPERATING AND MAINTENANCE.

	Salaries and Labor.	Fuel and Water.	Repairs.	Equipment.	Miscellaneous.	Totals.
General: —						
General superintendent,	\$2,974 00	—	—	—	—	\$2,974 00
Office,	1,251 17	—	—	—	\$824 16	2,075 33
General expense,	1,855 54	—	\$1,742 24	—	—	3,597 78
Power plant: —						
Heat,	13,906 55	\$65,793 74	2,381 27	—	—	82,081 56
Light,	5,709 39	—	1,238 93	—	—	6,948 32
Tools,	—	—	—	\$853 56	—	853 56
Amherst Water Company,	—	—	—	—	—	—
Night watchman,	1,999 52	2,717 90	—	—	—	2,717 90
Mail service,	270 59	—	—	—	—	1,999 52
Water mains,	281 53	—	—	—	—	270 59
Steam mains,	1,590 96	—	—	—	—	281 53
Electric light circuit,	2,102 93	—	—	—	—	1,590 96
Freight and express,	—	—	—	—	—	2,102 93
Telephone,	—	—	—	—	—	1,383 59
Truck,	31 41	—	459 09	—	—	1,615 69
Miscellaneous sundry,	96 52	—	—	—	450 24	459 09
Sewers and cesspools,	22 90	—	—	—	—	481 65
Walks and drives,	—	—	—	—	—	96 52
Emergency maintenance,	1,759 92	—	365 64	—	—	22 90
Expert service: —				284 73	487 83	2,898 12
Architect,	714 10	—	—	—	—	714 10
Engineer,	161 25	—	—	—	—	161 25
Fire department,	10 75	—	—	106 77	8 16	125 68
Totals,	\$34,739 03	\$68,511 64	\$6,187 17	\$1,345 06	\$4,769 67	\$115,552 57

EXPENSE OPERATING AND MAINTENANCE — *Continued.*

	Electric Repairs.	Plumbing Repairs.	Heat Repairs.	C. and M. Repairs.	Janitor.	Sundry.	Totals.
College buildings:—							
Adams Hall, . . . . .	\$3 69	—	—	—	—	\$278 43	\$282 12
Animal husbandry building, . . . . .	—	\$25 64	\$2 30	\$5 99	—	—	33 93
Apiary building, . . . . .	1 00	8 91	1 73	1 50	—	—	13 14
Chemical building, . . . . .	21 17	81 80	58 28	124 53	—	—	285 78
Clark Hall, . . . . .	1 46	85 33	10 53	155 23	—	—	252 55
Cold-storage building, . . . . .	—	—	—	42 00	—	—	42 00
Dairy building, . . . . .	17 22	174 08	596 84	303 83	—	—	1,092 07
Dairy barn and storage, . . . . .	78 30	201 59	10 45	202 05	—	—	492 39
Draper Hall, . . . . .	83 85	179 72	85 43	959 39	—	1,014 05	2,322 44
Drill Hall, . . . . .	2 80	354 37	33 09	125 16	—	—	515 42
Durfee glass house (old), . . . . .	—	—	118 75	—	—	—	33 48
Durfee glass house (new), . . . . .	—	—	118 75	18 35	—	—	137 10
Entomology building, . . . . .	3 92	84 15	23 97	261 27	—	—	373 31
French Hall, . . . . .	77 86	34 04	122 78	112 30	—	—	346 88
Horse barn, . . . . .	1 28	81 17	3 88	39 23	—	—	125 56
Horticultural barn, . . . . .	26 55	4 13	—	95 38	—	—	126 06
Hospital, . . . . .	23 36	30 36	—	182 07	—	—	235 79
Machine barn, . . . . .	—	74 82	—	68 13	—	—	142 95
Mathematics building, . . . . .	3 50	—	3 84	204 54	—	—	211 88
Microbiology building, . . . . .	20 10	54 93	5 38	51 83	—	—	132 24
Physics building, . . . . .	—	5 17	12 41	8 08	—	—	26 26
Piggery, . . . . .	—	30	—	64	—	—	94
Poultry No. 1, . . . . .	—	8 15	1 15	51 36	—	—	61 62
Poultry No. 2, . . . . .	1 65	3 30	—	1 20	—	—	6 15
Poultry No. 3, . . . . .	4 62	—	—	27 38	—	—	32 00
Poultry No. 5, . . . . .	—	—	—	96 96	—	—	96 96
Power building, . . . . .	128 88	207 14	91 55	360 29	\$360 70	—	1,157 56
Rural engineering building, . . . . .	4 92	—	—	53 13	—	—	58 05
Stockbridge Hall, . . . . .	41 13	35 52	50 71	168 41	—	—	295 77
Aronomy greenhouse, . . . . .	—	48	—	—	—	—	—
Turbine house, . . . . .	600 69	74 49	16 90	219 42	—	23 67	935 17
Upper plant house, . . . . .	5 73	60 69	38 97	97	—	—	106 36
Veterinary building, . . . . .	07	10 19	6 26	3 86	—	—	20 38

## EXPENSE OPERATING AND MAINTENANCE — Concluded.

	Electric Repairs.	Plumbing Repairs.	Heat Repairs.	C. and M. Repairs.	Janitor.	Sundry.	Totals.
Waiting station, . . . . .	-	\$26 87	\$22 29	\$3 55	-	-	\$3 55
Wilder Hall, . . . . .	\$50 09	23 72	-	6 98	-	-	106 23
Young stock barn, . . . . .	2 10	58 74	-	30 93	-	-	56 75
East Experiment Station, . . . . .	-	8 67	-	12 06	-	-	70 80
East Experiment Station barn, . . . . .	-	27 09	15 31	6 09	-	-	14 76
West Experiment Station, . . . . .	2 20	4 03	12 15	58 72	-	-	103 32
West Experiment Station barn, . . . . .	52	24 65	35	141 12	-	-	157 82
North College, . . . . .	138 14	113 95	11 21	108 67	\$659 74	\$165 25	1,157 00
South College, . . . . .	121 91	25 93	16 34	546 44	659 76	157 25	1,610 52
Chapel, . . . . .	52 98	-	-	114 78	301 08	-	511 11
Bell ringer, . . . . .	-	21 87	-	-	-	95 99	95 99
Cashier's house, . . . . .	-	38 29	13 32	7 28	-	-	29 15
Farm bungalow, . . . . .	7 97	130 22	25 50	10 15	-	-	69 73
Farmhouse No. 1, . . . . .	6 87	11 40	-	162 59	-	-	325 18
Farmhouse No. 2, . . . . .	11 85	10 40	-	21 21	-	-	44 46
Goldberg house, . . . . .	2 19	48 04	-	94 22	-	-	106 81
Harlow house, . . . . .	-	4 40	1 85	530 73	-	-	578 77
Head of Division of Horticulture, . . . . .	1 73	4 22	3 33	30 51	-	-	34 49
Kellogg house, . . . . .	1 00	49 53	14 44	8 31	-	28 96	45 82
President's house, . . . . .	17 70	6 63	-	116 30	-	10 12	208 09
Stockbridge house, . . . . .	-	14 79	-	43 70	-	-	50 33
Tillson house, . . . . .	-	-	-	18	-	-	14 97
Totals, . . . . .	\$1,571 96	\$2,529 91	\$1,404 97	\$6,059 60	\$1,990 28	\$1,773 72	\$15,390 44

## Summary.

General, . . . . .	.	.	.	.	.	.	\$115,552 57
College buildings, . . . . .	.	.	.	.	.	.	13,882 64
College residences, . . . . .	.	.	.	.	.	.	1,507 80
Totals, . . . . .	.	.	.	.	.	.	\$130,943 01

EXPERIMENT STATION.  
*Disbursements and Receipts.*

	Disburse- ments from Dec. 1, 1919, to Nov. 30, 1920.	Receipts from Dec. 1, 1919, to Nov. 30, 1920.	Apportion- ment for Year ending Nov. 30, 1920.	Balance to Credit.
Administration, . . . . .	\$943 03	\$1 35	\$1,100 00	\$156 97
Agricultural, . . . . .	8,747 21	1,689 80	9,500 00	752 79
Agricultural economies, . . . .	434 66	-	600 00	165 34
Botanical, . . . . .	2,046 51	-	2,100 00	53 49
Chemical, . . . . .	3,879 58	2,432 80	5,000 00	1,120 42
Cranberry, . . . . .	5,874 74	3,912 35	4,000 00	-1,874 74
Entomological, . . . . .	514 56	-	700 00	185 44
Freight and express, . . . . .	197 52	-	400 00	202 48
Horticultural, . . . . .	2,329 82	16 20	2,000 00	-329 82
Library, . . . . .	524 66	-	500 00	-24 66
Meteorology, . . . . .	364 58	-	400 00	35 42
Microbiology, . . . . .	848 38	-	1,400 00	551 62
Poultry, . . . . .	2,690 18	-	2,700 00	9 82
Publications, . . . . .	2,552 05	-	2,725 00	172 95
Salaries, . . . . .	60,444 48	-	51,775 00	-8,669 48
Treasurer's office, . . . . .	359 41	-	400 00	40 59
Veterinary, . . . . .	532 04	-	700 00	167 96
Hatch fund, . . . . .	-	15,000 00	-	-
Adams fund, . . . . .	-	15,000 00	-	-
Transferred to general maintenance,	-	2,935 19	-	-
State Treasurer, account of schedules,	-	60,364 07	-	-
Income remitted to State Treasurer, .	8,044 81	-	-	-
	\$101,328 22	\$101,351 76	\$86,000 00	-\$7,283 41
Less refunds, . . . . .	7 69	7 69	-	-
	\$101,320 53	\$101,344 07	-	-
Balance beginning fiscal year Dec. 1, 1919.	-	2,838 98	-	-
Balance on hand Nov. 30, 1920, . .	2,862 52	-	-	-
Totals, . . . . .	\$104,183 05	\$104,183 05	-	-

EXPERIMENT STATION — *Continued.*  
*Comparative Disbursements and Receipts, 1919-20.*

ACCOUNTS.	DISBURSEMENTS.		RECEIPTS.	
	1919.	1920.	1919.	1920.
Administration, . . . . .	\$835 87	\$943 03	\$1 00	\$1 35
Agriculture, . . . . .	9,205 27	8,747 21	4,908 59	1,689 80
Agricultural economics, . . . . .	699 16	434 66	-	-
Botanical, . . . . .	1,967 65	2,046 51	-	-
Chemical, . . . . .	4,991 27	3,879 58	3,820 67	2,432 80
Cranberry, . . . . .	3,618 41	5,874 74	4,234 46	3,912 35
Entomological, . . . . .	605 48	514 56	4 55	-
Freight and express, . . . . .	353 38	197 52	-	-
Horticultural, . . . . .	1,603 09	2,329 82	100 25	16 20
Library, . . . . .	742 17	524 66	-	-
Meteorology, . . . . .	321 96	364 58	-	-
Microbiology, . . . . .	1,258 22	848 38	-	-
Poultry, . . . . .	2,355 95	2,690 18	32 70	-
Publication, . . . . .	1,374 62	2,552 05	-	-
Salaries, . . . . .	50,753 50	60,444 48	-	-
Tillson farm, . . . . .	2,340 73	-	1,259 91	-
Treasurer's office, . . . . .	341 37	359 41	-	-
Veterinary, . . . . .	813 66	532 04	148 54	-
Hatch fund, . . . . .	-	-	15,000 00	15,000 00
Adams fund, . . . . .	-	-	15,000 00	15,000 00
Transferred to general maintenance,	-	-	-	2,935 19
State Treasurer, account of schedules,	-	-	48,728 05	60,364 07
Income remitted to State Treasurer,	8,752 05	8,044 81	-	-
	\$92,933 81	\$101,328 22	\$93,238 72	\$101,351 76
Less refunds, . . . . .	-	7 69	-	7 69
	\$92,933 81	\$101,320 53	\$93,238 72	\$101,344 07
Balance beginning of fiscal year, .	-	-	2,534 07	2,838 98
Balance on hand at close of fiscal year,	2,838 98	2,862 52	-	-
Totals, . . . . .	\$95,772 79	\$104,183 05	\$95,772 79	\$104,183 05



EXPERIMENT STATION — *Concluded.*  
*Analysis of Experiment Station Accounts.*

	Adams Fund.	Hatch Fund.	State Fund.	Totals.
Salaries, . . . . .	\$14,251 65	\$14,318 09	\$31,874 74	\$60,444 48
Labor, . . . . .	272 00	918 50	14,120 81	15,311 31
Publications, . . . . .	—	—	2,568 34	2,568 34
Postage and stationery, . . . . .	—	—	1,351 79	1,351 79
Freight and express, . . . . .	—	—	239 75	239 75
Heat, light, water and power, . . . . .	—	—	431 29	431 29
Chemical and laboratory supplies, . . . . .	—	—	1,211 26	1,211 26
Seeds, plants and sundry supplies, . . . . .	—	—	2,881 32	2,881 32
Fertilizers, . . . . .	216 22	—	950 45	1,166 67
Feedstuffs, . . . . .	—	—	790 14	790 14
Library, . . . . .	—	—	616 14	616 14
Tools, machinery and appliances, . . . . .	—	—	1,282 25	1,282 25
Furniture and fixtures, . . . . .	—	—	105 35	105 35
Scientific apparatus and specimens, . . . . .	—	—	344 28	344 28
Live stock, . . . . .	—	—	1,078 00	1,078 00
Traveling expenses, . . . . .	—	—	1,962 75	1,962 75
Contingent expenses, . . . . .	—	—	62 65	62 65
Buildings and land, . . . . .	—	—	1,435 64	1,435 64
Totals, . . . . .	\$14,739 87	\$15,236 59	\$63,306 95	\$93,283 41

*Summary.*

	Disbursements.	Receipts.
Cash on hand Dec. 1, 1919, . . . . .	—	\$2,838 98
Receipts from State Treasurer, . . . . .	—	63,299 26
Receipts from United States Treasurer, . . . . .	—	30,000 00
Receipts from other sources, . . . . .	—	8,044 81
Total disbursements, . . . . .	\$93,275 72 <sup>1</sup>	—
Receipts turned in to State Treasurer, . . . . .	8,044 81	—
	\$101,320 53	\$104,182 05
Bills receivable Dec. 1, 1919, deducted, . . . . .	—	770 44
Bills payable Dec. 1, 1919, deducted, . . . . .	954 14	—
	\$100,366 39	\$103,411 61
Bills receivable Nov. 30, 1920, . . . . .	—	640 87
Bills payable Nov. 30, 1920, . . . . .	169 19	—
Balance, . . . . .	3,516 90	—
	\$104,052 48	\$104,052 48

<sup>1</sup> Includes amount transferred to general maintenance, \$2,935.19.

EXTENSION SERVICE.<sup>1</sup>  
*Disbursements and Receipts.*

CLASSIFICATION.	Disbursements.	Receipts.	Apportionment.	Balance.
Administration, . . . . .	\$4,321 37	\$62 71	\$4,000 00	--\$321 37
Animal husbandry, . . . . .	787 49	-	1,200 00	412 51
Co-operative marketing, . . . . .	1,478 98	-	1,500 00	21 02
Correspondence Courses, . . . . .	1,592 61	643 00	800 00	-792 61
County agents' work, . . . . .	1,726 87	-	1,800 00	73 13
Dairying, . . . . .	1,584 42	-	1,800 00	215 58
Director's office, . . . . .	82 52	33 09	2,700 00	2,617 48
Emergency, . . . . .	-	-	2,000 00	2,000 00
Exhibits, . . . . .	3,649 04	-	5,000 00	1,350 96
Extension courses at College, . . . . .	1,318 55	-	3,000 00	1,681 45
Extension schools, . . . . .	488 03	28 75	250 00	-238 03
Farm management demonstration, . . . . .	1,202 67	123 53	1,000 00	-202 67
Home demonstration agents, . . . . .	5,901 85	173 14	4,500 00	-1,401 85
Home economics specialists, . . . . .	29 23	-	-	-29 23
Home gardening, . . . . .	760 24	-	300 00	-460 24
Horticultural manufactures, . . . . .	1,946 67	-	1,600 00	-346 67
Injurious insects, . . . . .	46 46	-	100 00	53 54
Junior Extension work, . . . . .	5,241 03	-	3,500 00	-1,741 03
Landscape extension, . . . . .	93 55	-	50 00	-43 55
Lectures, . . . . .	51 56	-	100 00	48 44
Library extension, . . . . .	317 98	-	400 00	82 02
Local community organization, . . . . .	-	-	100 00	100 00
Methods of Extension instruction, . . . . .	162 78	-	600 00	437 22
Plant diseases, . . . . .	68 65	-	100 00	31 35
Pomology, . . . . .	2,102 44	-	1,200 00	-902 44
Poultry husbandry, . . . . .	1,496 96	-	1,200 00	-296 96
Printing, . . . . .	2,325 74	4 00	2,600 00	274 26
Salaries, . . . . .	44,409 43	1,469 17	51,000 00	6,590 57
Sheep husbandry, . . . . .	550 18	-	600 00	49 82
Soils and crops, . . . . .	1,051 16	-	1,000 00	-51 16
State Treasurer, account of schedules, . . . . .	-	84,788 46	-	-
Income to State Treasurer, . . . . .	2,537 39	-	-	-
	\$87,325 85	\$87,325 85	\$94,000 00	\$9,211 54

<sup>1</sup> Includes State Smith-Lever Fund.

EXTENSION SERVICE — *Continued.**Summary.*

	Disbursements.	Receipts.
Balance Dec. 1, 1919, <sup>1</sup> . . . . .	—	\$4,623 72
Receipts Nov. 30, 1920, . . . . .	—	2,537 39
Received from State Treasurer, . . . . .	—	84,788 46
Received from United States Treasurer, . . . . .	—	31,247 93
Disbursements to Nov. 30, 1920, <sup>1</sup> . . . . .	\$113,811 81	—
Receipts turned in to State Treasurer, . . . . .	2,537 39	—
	\$116,349 20	\$123,197 50
Bills receivable Dec. 1, 1919, deducted, . . . . .	—	88 82
Bills payable Dec. 1, 1919, deducted, . . . . .	708 11	—
	\$115,641 09	\$123,108 68
Bills receivable Nov. 30, 1920, . . . . .	—	7 50
Bills payable Nov. 30, 1920, . . . . .	339 01	—
Balance, . . . . .	7,136 08	—
	\$123,116 18	\$123,116 18

<sup>1</sup> Includes Federal Smith-Lever Fund.

EXTENSION SERVICE — *Concluded.*  
*Analysis of Extension Service Disbursements.*

	Travel.	Equip- ment.	Supplies.	Postage, Sta- tionery and Small Printing.	Salaries and Labor.	Totals.
Administration, . . . .	\$1,414 07	\$754 36	\$572 61	\$1,493 34	\$86 99	\$4,321 37
Animal husbandry, . . .	720 73	-	8 01	58 75	-	787 49
Co-operative marketing, .	1,210 49	93 10	18 82	106 42	50 15	1,478 98
Correspondence Courses, .	-	84 60	72 72	1,217 63	217 66	1,592 61
County agents' work, . .	998 94	124 50	71 34	456 50	75 59	1,726 87
Dairying, . . . . .	1,281 75	2 00	10 65	61 87	228 15	1,584 42
Director's office, . . . .	-	65 81	22 60	10 33	-16 22	82 52
Exhibits, . . . . .	915 97	316 82	1,048 20	357 39	1,010 66	3,649 04
Extension courses at College, .	161 77	-	277 83	458 01	420 94	1,318 55
Extension schools, . . . .	34 80	-	62 93	287 98	102 32	488 03
Farm management demonstra- tion, . . . . .	514 57	-	55 12	342 12	290 86	1,202 67
Home demonstration agents, .	3,712 26	221 25	371 33	1,091 19	505 82	5,901 85
Home economics specialists, .	29 23	-	-	-	-	29 23
Home gardening, . . . . .	129 49	22 15	89 53	169 42	349 65	760 24
Horticultural manufactures, .	1,420 11	188 89	147 06	129 65	60 96	1,946 67
Injurious insects, . . . . .	46 46	-	-	-	-	46 46
Junior Extension work, . . .	3,588 78	36 35	937 16	656 12	22 62	5,241 03
Landscape extension, . . .	7 70	-	43 93	1 44	40 48	93 55
Lectures, . . . . .	24 06	-	-	-	27 50	51 56
Library Extension, . . . .	41 74	39 20	206 93	30 11	-	317 98
Local community organization,	-	-	-	-	-	-
Methods of Extension instruc- tion, . . . . .	53 53	-	20 07	2 25	86 93	162 78
Plant diseases, . . . . .	65 40	-	2 25	1 00	-	68 65
Pomology, . . . . .	1,366 40	162 27	300 58	48 86	224 33	2,102 44
Poultry husbandry, . . . .	1,325 11	15 14	47 18	66 28	43 25	1,496 06
Printing, . . . . .	48 56	468 68	-	1,808 50	-	2,325 74
Salaries, . . . . .	-	-	-	-	44,409 43	44,409 43
Sheep husbandry, . . . . .	425 10	-	23 49	47 01	54 58	550 18
Soils and crops, . . . . .	898 75	5 79	39 93	24 43	82 26	1,051 16
Totals, . . . . .	\$20,435 77	\$2,600 91	\$4,450 27	\$8,926 60	\$48,374 91	\$84,788 46

## SMITH-LEVER FUND (FEDERAL).

	Disbursements.	Receipts.
Administration, . . . . .	\$69 80	-
Animal husbandry, . . . . .	30 00	-
Dairying, . . . . .	30 00	-
Extension schools, . . . . .	241 54	-
District and county agents, . . . . .	57 16	-
Farm management demonstration, . . . . .	30 00	-
Home demonstration agents, . . . . .	407 15	-
Junior Extension, . . . . .	851 22	-
Pomology, . . . . .	30 00	-
Printing and publications, . . . . .	714 97	-
Salaries, . . . . .	26,531 51	-
Sheep husbandry, . . . . .	30 00	-
State Treasurer, . . . . .	-	\$31,247 93
	\$29,023 35	\$31,247 93
Balance beginning fiscal year Dec. 1, 1919, . . . . .	-	4,623 72
Balance on hand Nov. 30, 1920, . . . . .	6,848 30	-
Totals, . . . . .	\$35,871 65	\$35,871 65

## SHORT COURSES.

	Personal Services.	Office.	Laboratory Supplies.	Equipment.	Travel.	Printing.	Totals.
Two-Year Course, . . . . .	\$16,255 58	\$709 58	\$4,464 22	\$533 25	\$335 69	-	\$22,298 32
Ten Weeks' Winter School, . . . . .	707 96	137 53	111 43	12 75	18 04	-	987 71
Summer School, . . . . .	5,803 11	112 47	391 36	36 20	61 35	-	6,404 49
Administration, . . . . .	4,540 00	-	-	11 79	-	-	4,551 79
Printing, . . . . .	-	-	-	-	-	\$1,004 90	1,004 90
	\$27,306 65	\$859 58	\$4,967 01	\$593 99	\$415 08	\$1,004 90	\$35,247 21

## SUMMARY.

	Dr.	Cr.
State appropriation, . . . . .		\$39,600 00
Amount of receipts, . . . . .		4,810 25
Amount of receipts transferred to State Treasurer, . .	\$4,810 25	
Department expenditures, . . . . .	35,247 21	
Balance unexpended, . . . . .	4,352 79	
	\$44,410 25	\$44,410 25

## MARKET-GARDENING FIELD STATION.

	Debit.	Credit.
Labor, . . . . .	\$5,277 29	
Maintenance, . . . . .	2,617 78	
Equipment, . . . . .	62 43	
Total, . . . . .	\$7,957 50	
State appropriation, . . . . .		\$8,400 00
Amount of receipts, . . . . .		2,286 34
Amount of receipts transferred to State Treasurer, . .	\$2,286 34	
Department expenditures, . . . . .	7,957 50	
Balance unexpended, . . . . .	442 50	
	\$10,686 34	\$10,686 34

## SPECIAL APPROPRIATIONS.

	Date made.	Appropriation.	Amount expended to Date.	Unexpended Balance.
Power plant improvements, . . . . .	1917	\$40,000 00	\$39,988 16	\$11 84
Market-Garden Field Station, . . . . .	1918	16,500 00	16,496 14	3 86
Dining hall, . . . . .	1918	12,000 00	11,988 81	11 19
Improvements and equipment, . . . . .	1919	20,000 00	19,985 48	14 52
Women's dormitory, . . . . .	1919	127,400 00	106,235 81	21,164 19
Market-Garden Field Station, . . . . .	1919	15,000 00	9,404 95	5,595 05
Engineering studies, . . . . .	1919	2,000 00	1,937 18	62 82
Improvements and equipment, . . . . .	1920	50,000 00	24,847 41	25,152 59
Cavalry barn, . . . . .	1920	15,000 00	1,283 39	13,716 61
	—	\$297,900 00	\$232,167 33	\$65,732 67
Amount spent previous to Dec. 1, 1919, . . . . .	—	—	—	86,342 66
Amount expended during fiscal year, . . . . .	—	—	—	145,824 67
Unexpended balance Nov. 30, 1920, . . . . .	—	—	65,732 67	—
	—	\$297,900 00	\$297,900 00	\$297,900 00

## INVENTORY — REAL ESTATE.

*Land (Estimated Value).*

Angus land, . . . . .	\$800 00
Allen place, . . . . .	500 00
Baker place, . . . . .	2,500 00
Bangs place, . . . . .	2,350 00
Brown land, . . . . .	500 00
Charmbury place, . . . . .	450 00
Clark place, . . . . .	4,500 00
College farm, . . . . .	37,000 00
Cranberry land, . . . . .	12,745 00
Geo. Cutler, Jr., trustee, . . . . .	2,700 00
Dickinson land, . . . . .	7,850 00
Harlow farm, . . . . .	1,584 63
Hawley and Brown place, . . . . .	675 00
Kellogg place, . . . . .	3,368 45
Loomis place, . . . . .	415 00
Louisa Baker place, . . . . .	5,000 00
Market-Garden Field Station, . . . . .	4,800 00
Mount Toby demonstration forest, . . . . .	30,000 00
Newell farm, . . . . .	2,800 00
Old creamery place, . . . . .	1,000 00
Owen farm, . . . . .	5,000 00
Pelham quarry, . . . . .	500 00
Tillson farm, . . . . .	2,950 00
Westcott place, . . . . .	2,250 00
Total, . . . . .	\$132,238 08



*College Buildings (Estimated Value).*

	Inventory at Beginning of Year.	Per Cent de- ducted.	Value at Beginning of Year less De- terioration.	Repairs and Improve- ments during Year.	Total Value at Close of Fiscal Year.
Animal husbandry building, . . .	\$9,211 36	2	\$9,027 13	\$33 93	\$9,061 06
Apiary, . . . . .	2,993 02	2	2,933 16	13 14	2,946 30
Cashier's house, . . . . .	1,603 60	5	1,523 42	29 15	1,552 57
Chemical laboratory, . . . . .	8,333 84	5	7,917 15	598 40	8,515 55
Clark Hall, . . . . .	63,068 72	2	61,807 35	252 55	62,059 90
Cold-storage laboratory, . . . . .	10,973 77	2	10,754 29	42 00	10,796 29
Dairy building, . . . . .	70,175 79	2	68,772 27	1,092 07	69,864 34
Dairy barn and storage, . . . . .	26,918 07	3	26,110 53	492 39	26,602 92
Draper Hall, . . . . .	67,467 14	3	65,443 13	1,630 39	67,073 52
Drill hall and gun shed, . . . . .	8,763 96	5	8,325 76	944 51	9,270 27
Durfee glass house (old), . . . . .	8,157 21	5	7,749 35	33 48	7,782 83
Durfee glass house (new), . . . . .	12,049 70	5	11,447 21	137 10	11,584 31
Entomology building, . . . . .	73,639 10	2	72,166 32	373 31	72,539 63
Farm bungalow, . . . . .	2,584 01	3	2,506 49	69 73	2,576 22
Farm house No. 1, . . . . .	2,604 80	3	2,526 66	325 18	2,851 84
Farm house No. 2, . . . . .	4,172 38	8	3,838 59	44 46	3,883 05
French Hall, . . . . .	46,324 41	2	45,397 92	346 88	45,744 80
Grounds' tool shed, . . . . .	232 75	5	221 11	—	221 11
Harlow house, . . . . .	1,554 91	5	1,477 16	578 77	2,055 93
Horse barn, . . . . .	4,535 04	3	4,398 99	125 56	4,524 55
Head of Division of Horticulture, . . . . .	2,253 03	5	2,140 38	34 49	2,174 87
Horticultural barn, . . . . .	2,469 32	3	2,395 24	1,232 68	3,627 92
Horticultural tool shed, . . . . .	1,717 47	3	1,665 95	—	1,665 95
Horticultural open shed, . . . . .	—	—	—	501 38	501 38
Horticultural manufactures' shed, . . . . .	—	—	—	3,185 24	3,185 24
Hospital, . . . . .	14,617 46	2	14,325 11	235 79	14,560 90
Kellogg house and barn, . . . . .	2,568 69	5	2,440 26	803 66	3,243 92
Machinery barn, . . . . .	3,471 05	3	3,366 92	142 95	3,509 87
Market-Garden Field Station barn, . . . . .	3,293 15	3	3,194 36	—	3,194 36
Mathematics building, . . . . .	4,933 40	5	4,686 73	211 88	4,898 61
Microbiology building, . . . . .	58,937 64	2	57,758 89	132 24	57,891 13
Military storage, . . . . .	237 50	5	225 62	—	225 62
Mount Toby house and barn, . . . . .	3,809 67	5	3,619 19	—	3,619 19
North dormitory, . . . . .	24,519 60	2	24,029 21	1,157 00	25,186 21
Physics laboratory, . . . . .	4,793 40	5	4,553 73	26 26	4,579 99
Piggery, . . . . .	2,592 78	3	2,515 00	94	2,515 94

*College Buildings (Estimated Value) — Concluded.*

	Inventory at Beginning of Year.	Per Cent de- duced.	Value at Beginning of Year less De- terioration.	Repairs and Improve- ments during Year.	Total Value at Close of Fiscal Year.
Poultry department:—					
No. 1 demonstration building, . . . . .	\$1,330 55	2	\$1,303 94	\$61 62	\$1,365 56
No. 2 oil house, . . . . .	70 17	2	68 77	6 15	74 92
No. 3 brooder killing and fattening laboratory, . . . . .	2,332 49	2	2,285 84	—	2,285 84
No. 4 mechanics, storage building and incubator cellar, . . . . .	3,388 54	2	3,320 77	32 00	3,352 77
No. 5 laying house, . . . . .	1,640 44	2	1,607 63	96 96	1,704 59
No. 6 manure shed, . . . . .	92 84	2	90 98	—	90 98
No. 7 small henhouse, . . . . .	46 72	2	45 79	—	45 79
No. 8 breeding house, . . . . .	1,479 77	2	1,450 17	—	1,450 17
No. 9 experimental breeding house, . . . . .	580 39	2	568 78	—	568 78
No. 10 duck house, . . . . .	96 05	2	94 13	—	94 13
No. 11 unit house for 200 hens, . . . . .	485 93	2	476 21	—	476 21
No. 12 unit house for 100 hens, . . . . .	392 10	2	384 26	—	384 26
Power plant and storage building, in- cluding coal pocket, . . . . .	48,196 70	2	47,232 77	787 86	48,020 63
President's house, . . . . .	13,264 35	3	12,866 42	208 09	13,074 51
Quarantine barn, . . . . .	472 30	3	458 13	—	458 13
Rural engineering building, . . . . .	3,515 51	2	3,445 20	58 05	3,503 25
Sheep barn, . . . . .	1,413 59	3	1,371 18	—	1,371 18
South dormitory, . . . . .	37,306 65	2	36,560 52	2,010 52	38,571 04
Stockbridge Hall, . . . . .	172,179 48	2	168,735 89	295 77	169,031 66
Agronomy greenhouse, . . . . .	1,999 49	2	1,959 50	48	1,959 98
Stockbridge house, . . . . .	1,599 54	5	1,519 56	50 33	1,569 89
Stone chapel, . . . . .	27,891 96	2	27,334 12	1,373 86	28,707 98
Turbine house, . . . . .	17,665 00	2	17,311 70	935 17	18,246 87
Vegetable plant house, . . . . .	4,370 29	5	4,151 78	106 36	4,258 14
Veterinary laboratory and stable, . . . . .	22,083 55	2	21,641 88	20 38	21,662 26
Waiting station, . . . . .	466 77	2	457 43	3 55	460 98
Wilder Hall, . . . . .	34,303 15	2	33,617 09	106 23	33,723 32
Young stock barns, . . . . .	5,854 44	3	5,678 81	56 75	5,735 56
Totals, . . . . .	\$960,096 50	—	\$937,299 83	\$21,037 64	\$958,337 47

*College Equipment (Estimated Value).*

## Administrative division:—

Dean's office, . . . . .	\$461 80
President's office, . . . . .	2,485 00
Registrar's office, . . . . .	1,210 70
Treasurer's office, . . . . .	3,705 97

## Agricultural division:—

Agronomy, . . . . .	6,553 14
Animal husbandry, . . . . .	670 01
Dairy, . . . . .	24,569 10
Farm, . . . . .	46,950 59
Farm management, . . . . .	939 46
General agriculture, . . . . .	3,484 51
Poultry, . . . . .	6,513 04
Rural engineering, . . . . .	4,927 63

Domestic science, . . . . .	2,557 69
Dining hall, . . . . .	18,531 67
Extension, . . . . .	15,886 31

## General science:—

Apiary, . . . . .	2,235 18
Botanical, . . . . .	24,329 30
Chemical, . . . . .	18,088 69
Entomology, . . . . .	5,208 67
Mathematics, . . . . .	2,420 00
Microbiology, . . . . .	7,606 88
Physics, . . . . .	6,844 89
Veterinary, . . . . .	10,285 25
Zoological and geological, . . . . .	17,136 10

Graduate School, . . . . .	115 80
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## Horticultural division:—

Floriculture, . . . . .	31,771 86
Forestry, . . . . .	2,446 54
General horticulture, . . . . .	7,744 65
Grounds, . . . . .	1,986 38
Horticultural manufactures, . . . . .	4,626 65
Landscape gardening, . . . . .	5,427 66
Market-Garden Field Station, . . . . .	2,298 30
Market gardening, . . . . .	2,191 25
Mount Toby Reservation, . . . . .	4,061 51
Pomology, . . . . .	9,242 01

Hospital, . . . . .	1,131 75
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## Humanities division:—

Economics and sociology, . . . . .	134 72
Language and literature, . . . . .	678 00

Library, . . . . .	114,606 38
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Military, . . . . .	1,410 54
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## Operating and maintenance:—

College supply, . . . . .	1,674 03
Fire apparatus, . . . . .	2,079 60

## General maintenance:—

Carpentry and masonry supplies, . . . . .	7,473 46
Electrical supplies, . . . . .	4,208 75
Equipment, . . . . .	17,649 20
Heating and plumbing supplies, . . . . .	10,323 25

*College Equipment (Estimated Value) — Concluded.*Operating and maintenance — *Con.*

Painting supplies, . . . . .	\$1,497 04
Steam main, . . . . .	54,750 92
Lighting lines, . . . . .	8,675 80
Janitor's supplies, . . . . .	1,071 52
Sewer line, . . . . .	12,593 12
Water mains, . . . . .	11,373 32
Physical education, . . . . .	1,769 61
Rural social science: —	
Agricultural economics, . . . . .	1,620 45
Agricultural education, . . . . .	1,301 00
Rural sociology, . . . . .	351 32
Short course, . . . . .	990 11
Textbooks, . . . . .	2,318 08
Trophy room, . . . . .	1,200 00
Women's dormitory, . . . . .	9,001 35
Total, . . . . .	\$575,397 51

*Experiment Station Buildings (Estimated Value).*

	Inventory at Beginning of Year.	Per Cent.	Cost at Beginning of Year, less Per Cent De- terioration.	Repairs and Improve- ments during Year.	Total Value at Close of Year.
Agricultural laboratory, . . . . .	\$14,224 78	2	\$13,940 28	\$323 82	\$14,264 10
Agricultural barn, . . . . .	4,448 60	3	4,315 14	14 76	4,329 90
Agricultural farmhouse, . . . . .	1,417 41	3	1,374 89	106 81	1,481 70
Agricultural glass house, . . . . .	386 90	5	367 55	—	367 55
Cranberry buildings, . . . . .	3,412 96	5	3,242 31	—	3,242 31
Plant and animal chemistry laboratory, . . . . .	28,079 50	2	27,517 91	103 32	27,621 23
Plant and animal chemistry barns, . . . . .	4,081 24	3	3,958 80	157 82	4,116 62
Plant and animal chemistry dairy, . . . . .	1,717 47	3	1,665 95	—	1,665 95
Six poultry houses, . . . . .	562 53	2	551 28	—	551 28
Entomological glass houses, . . . . .	718 24	5	682 33	—	682 33
Tillson house, . . . . .	558 40	5	530 48	14 97	545 45
Tillson barn, . . . . .	1,083 00	5	1,028 85	—	1,028 85
Totals, . . . . .	\$60,691 03	—	\$59,175 77	\$721 50	\$59,897 27

*Experiment Station Equipment (Estimated Value).*

Apiary, . . . . .	\$158 92
Agricultural Economics Department, . . . . .	183 37
Agricultural laboratory, . . . . .	7,889 10
Botanical laboratory, . . . . .	6,558 38
Chemical laboratory, . . . . .	27,909 85
Cranberry station, . . . . .	4,442 48
Director's office, . . . . .	5,533 21
Entomological laboratory, . . . . .	23,787 06
Horticultural laboratory, . . . . .	4,976 75
Meteorological laboratory, . . . . .	673 00
Microbiological laboratory, . . . . .	2,380 00
Poultry Department, . . . . .	4,798 65
Treasurer's office, . . . . .	1,018 00
Total, . . . . .	<hr/> \$90,308 77

*Inventory Summary.*

Land, . . . . .	\$132,238 08
College buildings, . . . . .	958,337 47
College equipment, . . . . .	575,397 51
Experiment Station buildings, . . . . .	59,897 27
Experiment Station equipment, . . . . .	90,308 77
Total, . . . . .	<hr/> \$1,816,179 10

	Acres.
College estate (area), . . . . .	642.79
Cranberry station, Wareham (area), . . . . .	23.67
Market-Garden Field Station, Lexington (area), . . . . .	12.00
Mount Toby demonstration forest (area), . . . . .	755.27
Rifle range, . . . . .	46.20
Pelham quarry, . . . . .	.50
Total acreage, . . . . .	<hr/> 1,480.43

## STUDENTS' TRUST FUND ACCOUNT.

	Disburse- ments, Year ending Nov. 30, 1920.	Receipts, Year ending Nov. 30, 1920.	Balance on Hand.	Balance brought for- ward Dec. 1, 1919.
Athletics, . . . . .	\$16,603 61	\$15,414 63	—\$2,329 92	—\$1,140 94
Dining hall, . . . . .	94,648 47	96,514 72	—9,363 80	—11,230 05
Keys, . . . . .	90 50	89 00	75 50	77 00
Students' deposits, . . . . .	83,732 72	80,003 02	14,126 94	17,856 64
Social Union, . . . . .	1,196 70	975 51	596 74	817 93
Textbooks, . . . . .	9,825 19	9,970 64	820 08	674 63
Athletic field, . . . . .	34 15	514 85	224 44	—256 26
Uniforms, . . . . .	8 62	104 64	127 56	31 54
Cow testing, . . . . .	17,547 55	17,591 47	359 00	315 08
Totals, . . . . .	\$223,687 51	\$221,178 48	\$4,636 54	\$7,145 57
	4,636 54	7,145 57	—	—
	\$228,324 05	\$228,324 05	—	—

## CONDENSED OPERATING STATEMENT OF THE DINING HALL.

	Operating Charges.	Income.
<b>1919.</b>		
Dec. 1, balance, . . . . .	—\$11,230 05	—
<b>1920.</b>		
Nov. 30, Total disbursements, . . . . .	94,648 47	—
Outstanding bills, . . . . .	3,001 27	—
Total collections, . . . . .	—	\$96,514 72
Accounts outstanding, . . . . .	—	1,061 34
Inventory, . . . . .	—	14,559 79
Balance, . . . . .	3,256 06	—
	\$112,135 85	\$112,135 85

ENDOWMENT FUND.<sup>1</sup>

	Principal.	Income.
United States grant (5 per cent), . . . . .	\$219,000 00	\$7,300 00
Commonwealth grant (3½ per cent), . . . . .	142,000 00	3,313 32
Total, . . . . .	—	\$10,613 32

<sup>1</sup> This fund is in the hands of the State Treasurer, and the Massachusetts Agricultural College received two-thirds of the income from the same.

## BURNHAM EMERGENCY FUND.

	Market Value Dec. 1, 1920.	Par Value.	Income.
Two bonds American Telephone and Telegraph Company 4s, at \$770, . . . . .	\$1,540 00	\$2,000 00	\$80 00
Two bonds Western Electric Company 5s, at \$940, . . . . .	1,880 00	2,000 00	100 00
One United States Liberty Bond 4½s, at . . . . .	425 00	500 00	20 63
Puget Sound Traction, Light and Power Company 7s, . . . . .	490 00	500 00	17 50
	\$4,335 00	\$5,000 00	\$218 13
Unexpended balance Dec. 1, 1919, . . . . .	—	—	580 55
	—	—	\$798 68
Disbursements for fiscal year ending Nov. 30, 1920, . . . . .	—	—	501 22
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$297 46

## LIBRARY FUND.

Five bonds New York Central & Hudson River Railroad Company 4s, at \$700, . . . . .	\$3,500 00	\$5,000 00	\$200 00
Five bonds Lake Shore & Michigan Southern Railroad Company 4s, at \$850, . . . . .	4,250 00	5,000 00	200 00
Two shares New York Central & Hudson River Railroad Company stock, at \$74, . . . . .	148 00	200 00	10 00
Amherst Savings Bank, deposit, . . . . .	167 77	167 77	8 44
	\$8,065 77	\$10,367 77	\$418 44
Refund, . . . . .	—	—	11 21
	—	—	\$429 65
Disbursements for fiscal year ending Nov. 30, 1920, . . . . .	—	—	429 65

## SPECIAL FUNDS.

*Endowed Labor Fund (the Gift of a Friend of the College).*

Two bonds American Telephone and Telegraph Company 4s, at \$770, . . . . .	\$1,540 00	\$2,000 00	\$80 00
Two bonds Lake Shore & Michigan Southern Railroad Company 4s, at \$700, . . . . .	1,400 00	2,000 00	80 00
One bond New York Central Railroad debenture 4s, . . . . .	920 00	1,000 00	40 00
One bond Louisville Gas and Electric 7s, . . . . .	970 00	1,000 00	70 00
Amherst Savings Bank, deposit, . . . . .	143 39	143 39	7 22
One United States Liberty Bond 4½s, . . . . .	850 00	1,000 00	42 50
	\$5,823 39	\$7,143 39	\$319 72
Unexpended balance Dec. 1, 1919, . . . . .	—	—	393 75
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$713 47

*Whiting Street Scholarship Fund.*

One bond New York Central debenture 4s, . . . . .	\$920 00	\$1,000 00	\$40 00
Amherst Savings Bank, deposit, . . . . .	271 64	271 64	13 72
	\$1,191 64	\$1,271 64	\$53 72
Unexpended balance Dec. 1, 1919, . . . . .	—	—	395 19
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$448 91

SPECIAL FUNDS — *Continued.**Hills Fund.*

	Market Value Dec. 1, 1920.	Par Value.	Income.
Two United States Liberty Bonds 4½s, at \$850, . . . . .	\$1,700 00	\$2,000 00	\$83 75
One bond American Telephone and Telegraph Company 4s, at \$770, . . . . .	770 00	1,000 00	40 00
One bond New York Central & Hudson River Railroad debenture 4s, . . . . .	720 00	1,000 00	40 00
One bond New York Central Railroad debenture 4s, . . . . .	920 00	1,000 00	40 00
Three bonds Pacific Telephone and Telegraph Company 5s, at \$820, . . . . .	2,460 00	3,000 00	150 00
One bond Western Electric Company 5s, . . . . .	940 00	1,000 00	50 00
Amherst Savings Bank, deposit, . . . . .	72 75	72 75	3 65
Boston & Albany Railroad stock, 3½ bonds, at \$125, . . . . .	453 00	362 00	31 68
Electric Securities Company bonds, 1½ bonds, at \$820, . . . . .	967 60	1,180 00	59 00
Two bonds Louisville Gas and Electric 7s, at \$940, . . . . .	1,940 00	2,000 00	140 00
Unexpended balance Dec. 1, 1919, . . . . .	\$10,943 35	\$12,614 75	\$638 08
	—	—	914 96
Disbursements for fiscal year ending Nov. 30, 1920, . . . . .	—	—	\$1,553 04
	—	—	211 14
Cash on hand, . . . . .	—	—	\$1,341 90

*Mary Robinson Fund.*

Amherst Savings Bank, deposit, . . . . .	\$142 00	\$142 00	\$7 17
Boston & Albany Railroad stock, ¾ share, at \$125, . . . . .	47 00	38 00	3 32
Electric Securities Company bonds, 4½ bonds, at \$820, . . . . .	672 40	820 00	41 00
Unexpended balance Dec. 1, 1919, . . . . .	\$861 40	\$1,000 00	\$51 49
	—	—	290 50
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$341 99

*Grinnell Prize Fund.*

Ten shares New York Central & Hudson River Railroad stock, at \$74, . . . . .	\$740 00	\$1,000 00	\$50 00
Unexpended balance Dec. 1, 1919, . . . . .	—	—	245 74
Disbursements for prizes, . . . . .	\$740 00	\$1,000 00	\$295 74
	—	—	50 00
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$245 74

*Gassett Scholarship Fund.*

One bond New York Central & Hudson River Railroad debenture 4s, . . . . .	\$720 00	\$1,000 00	\$40 00
Amherst Savings Bank, deposit, . . . . .	11 64	11 64	54
Unexpended balance Dec. 1, 1919, . . . . .	\$731 64	\$1,011 64	\$40 54
	—	—	304 19
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$344 73



SPECIAL FUNDS — *Continued.**Massachusetts Agricultural College (Investment).*

	Market Value Dec. 1, 1920.	Par Value.	Income.
One share New York Central & Hudson River Railroad stock, at \$74, . . . . .	\$74 00	\$100 00	\$5 00
Unexpended balance Dec. 1, 1919, . . . . .	—	—	95 45
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$100 45

*Danforth Keyes Bangs Fund.*

Two bonds Pacific Telephone and Telegraph Company 5s, at \$820, . . . . .	\$1,640 00	\$2,000 00	\$100 00
Two bonds Union Electric and Power Company 5s, at \$820, . . . . .	1,640 00	2,000 00	100 00
Two bonds American Telephone and Telegraph Company 4s, at \$770, . . . . .	1,540 00	2,000 00	80 00
One United States Liberty Bond 4½s, . . . . .	850 00	1,000 00	42 50
Interest from students' loans, . . . . .	—	—	82 84
Unexpended balance Dec. 1, 1919, . . . . .	\$5,670 00	\$7,000 00	\$405 34
	—	—	577 78
Total loans made to students during fiscal year, \$2,539 00	—	—	\$983 12
Cash received on account of students' loans, . . . . .	—	—	1,964 00
Excess of loans made over accounts paid by students, . . . . .	—	—	575 00
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$408 12

*John C. Cutter Fund.*

One bond Pacific Telephone and Telegraph Company 5s, at \$820, . . . . .	\$820 00	\$1,000 00	\$50 00
Unexpended balance Dec. 1, 1919, . . . . .	—	—	161 50
Disbursements for fiscal year to date, . . . . .	\$820 00	\$1,000 00	\$211 50
	—	—	81 71
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$129 79

*William R. Sessions Fund.*

One \$500 bond New York Central & Hudson River Rail- road 6s, . . . . .	\$460 00	\$500 00	\$30 00
Three United States Liberty Bonds, two at \$1,000 and one at \$500, 4½s, at \$850, . . . . .	2,125 00	2,500 00	103 12
One bond Toledo Light and Power Company 7s, . . . . .	970 00	1,000 00	70 00
One bond United Electric Light Company 6s, . . . . .	1,000 00	1,000 00	60 00
Earnings from exchange of bonds, . . . . .	\$4,555 00	\$5,000 00	\$263 12
Unexpended balance Dec. 1, 1919, . . . . .	—	—	6 67
	—	—	50 58
Disbursements for fiscal year to date, . . . . .	—	—	\$320 37
	—	—	191 38
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$128 99

SPECIAL FUNDS — *Concluded.*  
*Alvord Dairy Scholarship Fund.*

	Market Value Dec. 1, 1920.	Par Value.	Income.
One United States Liberty Bond 4½s, . . . . .	\$850 00	\$1,000 00	\$41 25
One bond Toledo Light and Power Company 7s, . . . . .	970 00	1,000 00	70 00
Two bonds United Electric Light Company 6s, at \$1,000, . . . . .	2,000 00	2,000 00	120 00
	\$3,820 00	\$4,000 00	\$231 25
Earnings from exchange of bonds, . . . . .	—	—	6 67
Unexpended balance Dec. 1, 1919, . . . . .	—	—	215 30
Cash on hand Nov. 30, 1920, . . . . .	—	—	\$453 22

SUMMARY OF BALANCE ON HAND OF THE INCOME FROM FUNDS HELD IN  
 TRUST BY THE MASSACHUSETTS AGRICULTURAL COLLEGE.

Burnham emergency fund, . . . . .	\$297 46
Endowed labor fund, . . . . .	713 47
Whiting Street scholarship fund, . . . . .	448 91
Hills fund, . . . . .	1,341 90
Mary Robinson fund, . . . . .	341 99
Grinnell prize fund, . . . . .	245 74
Gassett scholarship fund, . . . . .	344 73
Massachusetts Agricultural College investment fund, . . . . .	100 45
Danforth Keyes Bangs fund, . . . . .	408 12
John C. Cutter fund, . . . . .	129 79
William R. Sessions fund, . . . . .	128 99
Alvord Dairy Scholarship fund, . . . . .	453 22
Total, . . . . .	\$4,954 77

I hereby certify that I have this day examined the Massachusetts Agricultural College account, as reported by the treasurer, Fred C. Kenney, for the year ending Nov. 30, 1920. All bonds and investments are as represented in the treasurer's report. All disbursements are properly vouched for, and all cash balances are found to be correct.

CHARLES A. GLEASON,  
*Auditor.*

JAN. 6, 1921.

## HISTORY OF SPECIAL FUNDS.

## Burnham emergency fund:—

A bequest of \$5,000 from T. O. H. P. Burnham of Boston made without any conditions. The trustees of the College directed that \$1,000 of this fund should be used in the purchase of the Newell land and Goessmann library.

The fund now shows an investment of . . . . \$4,000 00

## Library fund:—

The library of the College at the present time contains 64,765 volumes. The income from the fund raised by the alumni and others is devoted to its increase, and additions are made from time to time as the needs of the different departments require. Dec. 27, 1883, William Knowlton gave \$2,000; Jan. 1, 1894, Charles L. Flint gave \$1,000; in 1887, Elizur Smith of Lee, Mass., gave \$1,315. These were the largest bequests, and now amount to . . . . .

10,000 00

## Endowed labor fund:—

Gift of a friend of the College in 1901, income of which is to be used for the assistance of needy and deserving students, . . . . .

5,000 00

## Whiting Street scholarship fund:—

Gift of Whiting Street of Northampton, for no special purpose, but to be invested and the income used. This fund is now used exclusively for scholarship, . . . . .

1,000 00

## Hills fund:—

Gift of Leonard M. and Henry F. Hills of Amherst, Mass., in 1867, to establish and maintain a botanic garden, . . . . .

10,000 00

## Mary Robinson fund:—

Gift of Miss Mary Robinson of Medfield, in 1874, for scholarship, . . . . .

1,000 00

## Grinnell prize fund:—

Gift of Hon. Wm. Claflin, to be known as the Grinnell agricultural prize, to be given to the two members of the graduating class who may pass the best oral and written examination in theory and practice of agriculture, given in honor of George B. Grinnell of New York, . . . . .

1,000 00

## Gassett scholarship fund:—

Gift of Henry Gassett of Boston, the income to be used for scholarship, . . . . .

1,000 00

## Massachusetts Agricultural College investment fund:—

Investment made by vote of trustees in 1893 to purchase one share of New York Central & Hudson River Railroad stock. The income from this fund has been allowed to accumulate, . . . . .

100 00

## Danforth Keyes Bangs fund:—

Gift of Louisa A. Baker of Amherst, Mass., April 14, 1909,  
the income thereof to be used annually in aiding poor,  
industrious and deserving students to obtain an education  
in said College, . . . . . \$6,000 00

## John C. Cutter fund:—

Gift of Dr. John C. Cutter of Worcester, Mass., an alumnus  
of the College, who died in August, 1909, to be invested  
by the trustees, and the income to be annually used for  
the purchase of books on hygiene, . . . . . 1,000 00

## Alvord dairy scholarship fund:—

Gift of Henry E. Alvord, who was the first instructor in  
military tactics, 1869-71, and a professor of agriculture,  
1885-87, at this institution. The income of this fund is  
to be applied to the support of any worthy student of said  
college, graduate or postgraduate, who may be making  
a specialty of the study of dairy husbandry (broadly  
considered), with the intention of becoming an investi-  
gator, teacher or special practitioner in connection with  
the dairy industry, provided that no benefits arising  
from such fund shall at any time be applied to any person  
who then uses tobacco in any form, or fermented or  
spirituous beverages, or is known to have done so within  
one year next preceding, . . . . . 4,000 00

## William R. Sessions fund:—

In accordance with the request of my deceased wife, Clara  
Markham Sessions, made in her last will, I bequeath to  
the trustees of the Massachusetts Agricultural College,  
Amherst, Mass., the sum of \$5,000, it being the amount  
received by me from the estate of the said Clara Mark-  
ham Sessions. The said \$5,000 to be kept by the said  
trustees a perpetual fund, the income from which shall  
be for the use of the Massachusetts Agricultural College;  
and according to the further request of my deceased wife,  
made in her last will, this is to be known as the William R.  
Sessions fund, and is to be a memorial of William R. Ses-  
sions; and it is my special request that the said trustees  
shall make record of the fact that this fund came from the  
estate of my deceased wife, Clara Markham Sessions, in  
accordance with her request made in her last will, . . . 5,000 00

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\$49,100 00

FRED C. KENNEY,

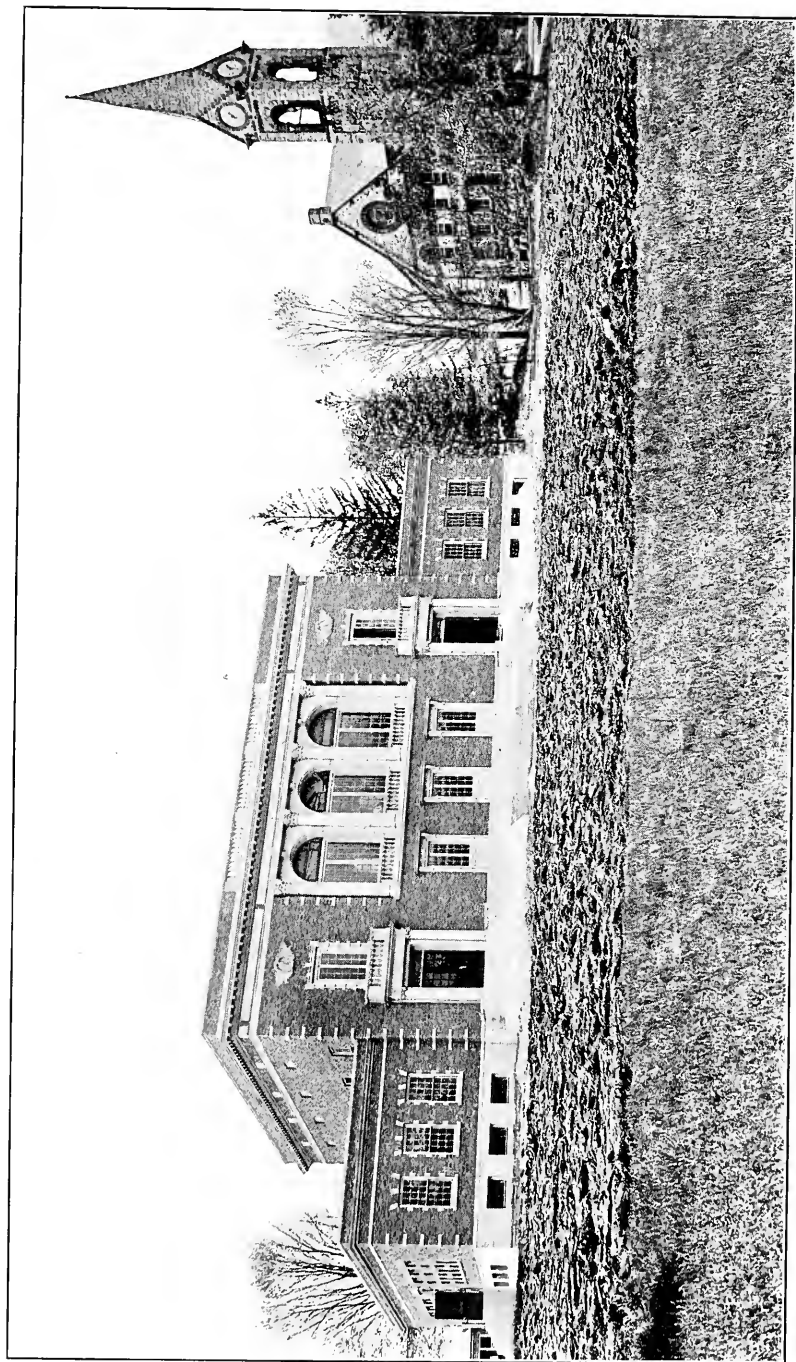
*Treasurer.*

**Massachusetts Agricultural College**  
**In the War**









MEMORIAL HALL

"WE WILL KEEP FAITH WITH YOU WHO LIE ASLEEP"



THE M. A. C. BULLETIN—AMHERST, MASS.

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Vol. XIII

MAY, 1921

Number 4

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PUBLISHED EIGHT TIMES A YEAR BY THE  
MASSACHUSETTS AGRICULTURAL COLLEGE:  
JAN., FEB., MARCH, MAY, JUNE, SEPT., OCT.,  
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HERST, MASS., AS SECOND CLASS MATTER

# Massachusetts Agricultural College In the War



PUBLICATION OF THIS DOCUMENT  
APPROVED BY THE  
SUPERVISOR OF ADMINISTRATION.

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## FOREWORD

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To the sons of M. A. C. this book will always be a sacred volume. It tells the proud story of Alma Mater's devotion and patriotism during the most critical days in the long march of democracy and liberty. It presents simply the plain facts which set forth, better than eulogy or eloquence, the essential nobility of her spirit and the stern grandeur of her soul.

These pages do not contain all the precious facts nor tell the full story. No pages could tell all. Could, indeed, any page do more than give a slight glimpse of her noble deeds and flaming passion? The broken records must therefore suffice. They are enough, however, to reveal to us her hidden secret and true glory.

Brother Alumni, you will find in these pages a record that breathes of highest endeavor, splendid consecration, heroic achievement and the supremely beautiful surrender of youth and life to a great cause. You will find them inspiring you to pledge yourselves anew to God and country, and to bow your heads reverently in gratitude and love for the wonderful legacy left to you and your successors. You will find, too, that they will make you glad, infinitely glad, to know that you are the brothers of these brothers, and the children of this great mother.

AMHERST, MASS., May 4, 1921.



# MASSACHUSETTS AGRICULTURAL COLLEGE IN THE WAR

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## EARLY MILITARY RESPONSE

The mobilization of the French Army in August, 1914, marked the initial participation of the Massachusetts Agricultural College in the World War. As soon as France declared war, Robert Henri Chapon, a member of the class of 1914, left his position with a prominent business house in Boston, and sailed for France to take part in the world struggle. "Bob" was of French ancestry, and responded to the call of his native land with characteristic promptness, zeal, and patriotism. Together with thousands of other French soldiers he was sent into active service during the first terrible months of the German advance, with inadequate military training, and was killed on the field of battle at Verdun December 30, 1914. He was the first M. A. C. man and perhaps the first American college man to lose his life in the war.

During the fall of 1914, and through the years of 1915 and 1916, a few M. A. C. men joined the army either of their own country or of one of the allied countries engaged in the war. By the first of January, 1917, probably a dozen men from this College were in military service.

In March, 1917, when America's entrance into the war seemed inevitable, our students grew impatient to be among the first of those who should be ready to take an active part in the struggle. One morning early in that month three members of the senior class came to President Butterfield and asked what arrangements could be

made for them to receive their diplomas, provided they should leave college then to join the army. These men left in March, and after a brief period spent in intensive study at Washington, passed their examinations and were commissioned in the regular army. These men were Walter A. Mack, Everett L. Upson and Arthur F. Williams. As soon as a state of war with Germany was declared, scores of our students immediately made their plans to volunteer for military or naval service. Soon word was received that an Officers' Training School at Plattsburg would open in May. The announcement of the quota which might be sent from this institution at once brought joy and disappointment to our men, — joy to those who hoped that they might be among the fortunate ones to be chosen, and disappointment to those who realized that because of the selective process there would not be an opportunity for all to go. Later an adjustment was made whereby the unfilled quota of a near-by institution was allotted to the Massachusetts Agricultural College. Forty-three undergraduates and alumni of the Massachusetts Agricultural College were finally admitted to the First Officers' Training School, and practically every one of these men received a commission at the end of the period of training. This was an exceptional record, because approximately only 65 per cent of the whole number were commissioned.

It should be remembered that this early enthusiasm on the part of M. A. C. men was exhibited before the first draft law was mentioned.

Scores of undergraduates and graduates were admitted through our military department, or through other agencies, to the Second Officers' Training School at Plattsburg, opening in August, 1917; to the Third Officers' Training School, opening at Yaphank, L. I., in January, 1918; and to the Fourth Officers' Training Schools, held at various centers in May, 1918.



## M. A. C. IN THE WAR

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Captain Henry W. Fleet was then the military commandant at the College, and he was untiring in his efforts to assist M. A. C. men in their endeavors to gain admittance to the officers' training schools, as well as to other branches of the military organization. In the summer of 1917 he was transferred to larger and more responsible duties, and during the entire war, as an officer of high rank, made an enviable record for efficiency and leadership. But he never lost his affection for M. A. C. and her men, and often when serving in important military stations in France he found opportunity to render some special service to those whom he had known in Amherst.

### THE MASSACHUSETTS FOOD COMMITTEE

On February 9, 1917, Governor McCall, in anticipation of war with Germany, appointed one hundred citizens of the Commonwealth as a Committee on Public Safety. Naturally the military aspect of the situation was uppermost in the mind of the Governor and of those whom he selected for the committee, and in its original organization of subcommittees, no recognition was made of the agricultural problems confronting the State. President Butterfield immediately corresponded with Mr. James J. Storrow, chairman of the committee, in reference to the importance of recognizing food supply as a war emergency, with the result that Mr. Storrow requested the Massachusetts Federation for Rural Progress to name a committee on food production and conservation. This request was complied with on March 2, the committee was at once made a subcommittee of the Committee on Public Safety, and on March 5 was organized with Mr. John D. Willard of the Franklin County Farm Bureau, and subsequently director of the Extension Service of the College, as executive secretary. The personnel of the committee was as follows:

## M. A. C. IN THE WAR

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Kenyon L. Butterfield, <i>Chairman</i> .	Carlton D. Richardson.
Philip R. Allen.	Henry Sterling.
Reginald W. Bird.	Marcus L. Urann.
Nathaniel I. Bowditch.	Wilfrid Wheeler.
Joshua L. Brooks.	John D. Willard, <i>Secretary</i> .

The program of food production developed by the committee outlined three sources of increased production, — the first and chief, on farms, largely with the staple crops; the second, in boys' and girls' gardens; and the third, through family gardens carried on by residents of cities and villages. Later an auxiliary committee on food conservation was organized, with Dean Sarah Louise Arnold of Simmons College as chairman.

President Butterfield, as chairman of the food committee, for over a year took an active part in formulating and directing the policies of this important project, which became one of the most necessary and useful under the Massachusetts Public Safety Committee.

### CAMPUS MOBILIZATION

The College at once placed its entire resources at the disposal of the Commonwealth as represented by the Committee on Public Safety, stating that it wished to render every possible service in the emergency. Its attitude towards both State and national governments is shown by the following vote of the faculty passed April 5, 1917:

*Whereas*, The land grant colleges of America, owing their origin to the stern realization of the absolute need and utter unpreparedness of the nation during the darkest period of the great strife (the Civil War), were established in order that the nation might ever be ready to meet victoriously any and every foe that might oppose her at any time during the long future; and

*Whereas*, To these colleges, during all the years since the

## M. A. C. IN THE WAR

---

Morrill Land Grant Act, the people of the United States and of the Commonwealth have given generously of their substance and wealth, and ever manifested unfailing loyalty and love to them; and

*Whereas*, The Massachusetts Agricultural College, as one of the members of this noble sisterhood of colleges, has been bountifully nurtured and blessed by the rare munificence of the government; be it therefore

*Resolved*, That we, the faculty of the Massachusetts Agricultural College, fully recognizing our peculiar obligations to our beloved country in this hour of her new danger and peril, do pledge anew to her and to her cause our utmost loyalty and devotion, and place at her service without reservation all the strength, influence and resources which God hath vouchsafed to us; and be it further

*Resolved*, That a copy of this resolution be forwarded to the President of the United States and to the Governor of this Commonwealth, and that it be placed before the people as the true attitude of the faculty of the Massachusetts Agricultural College.

A committee on campus mobilization was organized March 5 with the following personnel: Professor William D. Hurd, Dr. William P. Brooks, Professor Fred C. Sears and Professor William P. B. Lockwood. This committee made a census of students and alumni with reference to their fitness and willingness to perform either military or agricultural service. The committee also canvassed the entire faculty and made assignments to different projects of endeavor in accordance with a definite and well-considered plan. The committee also acted as a clearing house for students and faculty desiring to enlist in agricultural work, approved and organized projects, and assigned members of the staff to special pieces of work as occasion demanded.

The members of the Extension staff carried on their regular work, but in a highly augmented fashion. Their

service was performed very largely in co-operation with the county farm bureaus, which soon became the actual centers of intensified agricultural operation throughout the State. Many of the teaching staff, as soon as they were relieved from their regular duties, took up special war service assigned to them in the field or on the campus. The research work of the Experiment Station naturally went on as usual, inasmuch as all such work was concerned more or less directly with problems of food production.

### WAR WORK OF THE FACULTY

Many members of the faculty left for war service; some resigned their positions for this purpose, and others were granted leaves of absence. The policy of the College was to support claims for deferred classification for those members of the staff seeking such on occupational grounds.

The carrying out of the program for food production, distribution, and conservation, which was developed by the Massachusetts State food committee in 1917, required the assistance of many trained experts. The College had placed itself and all its resources at the disposal of this committee, and a majority of the teaching staff aided in some capacity in the agricultural mobilization work of that season. In doing this many voluntarily gave up nearly all of their summer vacation. Under the direction of Professor Lockwood, secretary of the campus committee on mobilization, records were kept of all mobilization work done for the thirty-five week period beginning April 1 and ending November 30, 1917. The following statistics are compiled from his records:

# M. A. C. IN THE WAR

## GROUP I. — *Statistics of Mobilization Work*

Total number of members of teaching staff available for work during this period, . . . . .	73
Total number who participated in mobilization work, . . . . .	55
Devoting 50 or more days to mobilization work, . . . . .	23
Devoting from 25 to 50 days, . . . . .	9
Devoting from 10 to 25 days, . . . . .	14
Devoting less than 10 days each, . . . . .	9

The total number of working days contributed by the teaching staff was 2,486, the equivalent of 414 working weeks, or 7.96 years. In addition the Extension Service so adjusted its work as to contribute the equivalent of 1,476 working days, the equivalent of 240 working weeks, or 4.73 years. The actual salary thus represented was, for the faculty, \$14,651.13, and for the Extension staff, \$9,355.25, making a total of \$24,006.38. In addition, it was estimated that at least \$8,000 was contributed to the work through office supplies, clerical assistance, printing, and travel.

## GROUP II. — *Special Activities of the College in Mobilization Work*

ACTIVITY.	DAYS.		
	By Teachers.	By Extension Workers.	Total.
<i>State Public Safety Committee.</i>			
Agricultural and food work:			
Policy, organization, etc., . . . . .	51	40	91
Administration, . . . . .	45	57	102
Publicity, . . . . .	78	—	78
Labor Bureau, . . . . .	154	—	154
Organization, cities and towns, . . . . .	24	—	24
Fuel administration, . . . . .	24	—	24

# M. A. C. IN THE WAR

## GROUP II. — *Special Activities of the College in Mobilization Work* — Concluded

ACTIVITY.	DAYS.		
	By Teachers.	By Extension Workers.	Total.
<i>College Mobilization Committee.</i>			
Organization, administration, assigning men, etc.,	103	59	162
Boston Common Information Bureau, <sup>1</sup> . . . .	127	—	127
Special help for county agents, . . . . .	104	21	125
Publicity, <sup>2</sup> . . . . .	83	88	171
Survey and tabulation:			
Food and food production, . . . . .	242	56	298
Marketing and distribution, . . . . .	170	89	259
Food consumption, . . . . .	254	2	256
Milk production cost, . . . . .	161	110	271
Poultry production campaign, . . . . .	69	14	83
Food production lectures, . . . . .	58	11	69
Food conservation and preservation, lectures and demonstrations, <sup>3</sup>	184	664	848
Marketing lectures, . . . . .	1	—	1
Plant disease control work, . . . . .	27	—	27
Insect control work, . . . . .	6	—	6
Special bee meetings, . . . . .	5	—	5
Food research, canning and soy beans, . . . .	206	—	206
Junior Extension work (boys' and girls' clubs), .	58	177	235
General lectures, war work, Liberty Bonds, etc., .	10	—	10
Conferences and preparation work not classified, .	190	61	251
Work not classified above, . . . . .	52	27	79
Totals, . . . . .	2,486	1,476	3,962

<sup>1</sup> There were 5,733 people who asked for information at the Information Bureau (tent) on Boston Common.

<sup>2</sup> There were 89 news letters issued (these were sent to the newspapers in 275 cities and towns); 12 weekly reports were prepared (these were sent to the food committees of 452 cities and towns); 36 special circulars and bulletins were published for distribution.

<sup>3</sup> There were 71 one and two day schools held at which members of the Extension staff gave instruction (attendance, 9,926); 6 four-day schools for leaders in farm bureau and garden work were held; 390 students were allowed to leave College by May 1, 1917, for approved agricultural work, chiefly on farms and as garden supervisors (36 of these students and 4 alumni were placed as agricultural and garden supervisors); 2 members of the teaching staff did 25 days, each, on special research work for the United States Department of Agriculture (not listed above).

### WAR WORK OF THE EXPERIMENT STATION

It was found inexpedient to make any radical changes in the work of the Experiment Station because of the war. Nearly every investigation bore directly on the production of food, while the control work with fertilizers and feed-stuffs could not be interrupted because of the possibilities of low-priced substitutes for high-priced standard materials.

Various lines of investigation suggested by war conditions were undertaken. Varieties of wheat and rye were grown for a comparative test of yields and quality. Nutrition studies with young animals were undertaken to determine their minimum protein needs. The fundamental principles of sterilizing food by heat were investigated in connection with the canning of fruit and vegetables. The back-yard war gardens with their lights and shadows led to a study of the effects of different intensities of light on common garden crops. Studies of the economic conditions of marketing crops were carried on in a limited way. This last-named project and the canning project were limited by a lack of assistants, as the men engaged were one by one drawn into the military service and no one could be secured for the vacancies.

The general effect of the war was to lessen the activities of the Experiment Station by the withdrawal of men for war service.

### SPECIAL WAR SERVICE DIRECTED BY THE EXTENSION SERVICE

During the ten years prior to 1917 there had gradually been built up in this country a system of agricultural Extension work which was to be called upon during the war to render an immediate service more important than had been anticipated by its most ardent supporters. This national system is made up of three units, — the

Federal government, represented by the United States Department of Agriculture; the State, represented by the Agricultural College; and the county, represented by the farm bureau.

This agricultural Extension Service — the co-operation of these three agencies — which had been developed in Massachusetts during the past decade served well the needs of the State in the emergency.

The entire organization was at the command of the State food production committee to handle matters of farm and suburban production and the home conservation of food. All regulatory matters were administered by the Food Administration. Local county and town committees were organized for food production and conservation.

It is impossible to recite in detail how this Extension organization functioned in helping to secure a better food supply, to conserve food, and thereby to inculcate in the minds of the people proper ideas of patriotism and support of the nation during this war period; but a few instances will give some idea of the work done.

In increased farm production much was accomplished. Franklin County alone increased its crops in the following ratios: corn (grain), 29 per cent; silage, 58 per cent; oats, 64 per cent; wheat, 33 per cent; potatoes, 10 per cent; beans, 10 per cent, and rye, 18 per cent.

Over the State as a whole, in spite of the shortage of good seed corn, twenty-nine thousand acres more corn were grown in 1918 than in 1916. Dairy production was maintained and State-wide campaigns for the larger use of dairy products were organized. The number of hogs and sheep was largely increased.

The movement for home and factory gardens became popular. A careful census showed that during 1918 there were more than two hundred and eighty thousand non-commercial gardens on which garden produce to the value of more than \$6,000,000 was raised, and four hundred



and twenty-five supervisors were actively engaged in giving advice and helping to direct the growing of these gardens.

Food conservation was taught and demonstrated by State specialists and rural and urban agents. Training schools for leaders were held at the College and in several counties, as well as at normal schools. Economy in the use of clothing, and assistance in home management and budget making was given. Large classes of young women were instructed in Smith and Mount Holyoke colleges. The amount of food canned and preserved under the direction of Extension instructors can be counted by the hundreds of thousands of cans. Young women of foreign nationality were trained in conservation work and then sent among their own people to teach and to demonstrate. Persons especially trained for the task did special work with the industrial workers.

Great progress was made in the movement to encourage more fruit and vegetable preservation on the part of homemakers and by community effort. Communities were assisted in the installation of properly equipped plants, and groups were instructed in the organization of the work. Special campaigns for the conservation of sugar were handled by six hundred and thirty-five leaders who had been specially trained in this work.

A large amount of miscellaneous emergency assistance was given to various organizations during the period of the war. Some of the principal projects were as follows: service to the Federal Milk Commission in fixing the price of milk; securing farm help for farms; making surveys of food conditions in and about cities; rendering expert advice and assistance to other State institutions; helping to place units of State-owned machinery on farms; instruction to a unit of the Woman's Land and Agricultural Army; assistance to the farm operated by the United States Army at Camp Devens; and teaching war aims and American ideals.

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While it can be truly said that Federal, State, county, and local Extension Service agents were largely responsible for the organization of and instruction in these various movements, yet there are at least three significant things that should not be overlooked. First, this great work was accomplished without the creation of new, overlapping or duplicating machinery; it was simply necessary to add more people to do the extra work demanded. Second, it was a work in which the other publicly supported agencies of the State, privately supported institutions, and individuals co-operated liberally in a whole-hearted manner. Third, the volume of work done and the results obtained would never have been possible without a general attitude of receptiveness, a willingness to learn, to do, and to make any sacrifices necessary, on the part of people generally when they once understood the necessity or motive which was behind the movement or request.

### AGRICULTURAL PRODUCTION ON THE COLLEGE FARM

On April 19, 1917, the farm committee of the trustees met at Amherst and arranged with the farm and horticultural departments for the planting of larger areas of staple crops than had been contemplated. About forty acres of land not previously cultivated were assigned for this purpose. At that time, also, arrangements were made whereby members of the faculty could obtain garden plots on land owned by the College.

### WAR WORK OF THE STUDENTS IN 1917 AND 1918

Acting in accordance with expressions coming from President Wilson, Secretary of War Baker and others, as well as in harmony with the convictions of the President and the Dean of the College, every endeavor was made, after war was declared, to maintain the teaching work

on a normal basis. It soon developed, however, that not only were the students very uneasy and inclined to neglect class work, but the demand for farm labor in the State was such that their help was greatly needed. Consequently, the faculty passed a vote on April 20, 1917, providing that students who wished to leave before the end of the year to work on farms should receive credit for their college courses if they performed satisfactory farm labor for twelve weeks. Under this plan a large majority of the students left within two weeks, and by the first of May the College was practically closed.

Nearly all of the students going into agriculture found their own positions, although the committee on mobilization assisted in many cases. Approximately four hundred men found employment in farming, gardening or in supervision of such enterprises as boys' and girls' clubs, or community garden plots. About fifty men went into military service. All told, nearly five hundred students, or about 95 per cent of the total, were performing war emergency service by the first of June, 85 per cent being in agricultural service and 10 per cent in military service. This is a remarkable and significant record. Every effort was made to keep in touch with the students in the field; many were visited personally during the summer by members of the staff. Reports were made by the students as well as by their employers. Dean Lewis devoted a large part of the summer to analyzing these reports, and to corresponding with both students and employers. Many men who had never before had farm experience readily adapted themselves to the work, and the testimony of employers was uniformly most complimentary to the men.

The College year 1917-18 opened with a greatly reduced attendance. Of 138 men who in the fall of 1916 registered in the class of 1918, only 64 returned to College in 1917. In the class of 1919 the attendance was 113 in 1917, as against 174 registered in the fall of 1916; 117 out of 170

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in the class of 1920 returned in 1917. In 1917 there were 118 freshmen as compared with a registration of 170 in 1916.

In order to allow those students who were on farms to render the fullest possible service, the College year in the fall of 1917 did not open until October 10.

By the spring of 1918 many of the students had volunteered for military service, and the draft had taken more. Of those who finished the academic year in April, 1918, nearly every man immediately entered the army or navy, or went to work in munition plants, shipyards or on agricultural projects.

In November, 1917, a joint committee of undergraduates and faculty undertook the task of providing Christmas boxes for M. A. C. men who were overseas, and every such man whose address was known, as well as many men in home camps, was reminded at the holiday season that he had devoted and loving friends at Aggie. The practice of writing to at least one soldier every Sunday night was also encouraged among the fraternities. Over one hundred "Smileage" books, providing free admission to camp theatres, were purchased and distributed to M. A. C. men in American camps. In this as in many other campus activities the women students displayed a most commendable spirit of patriotism and loyalty to the great cause and to the M. A. C. men who were fighting and sacrificing for it.

### ACADEMIC ADJUSTMENTS

As previously stated, the spring term of 1917 was completely disorganized. All students who left for military or agricultural service, and who remained in this service for at least three months, were given credit for the term's work. On account of the apparent need for men in the agricultural industry in 1917 and 1918, it was thought best to change the academic year of 1917-18 to three terms

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of nine weeks each. Accordingly, College opened October 10, 1917, and closed April 27, 1918. It was hoped that by a general speeding up practically as much could be accomplished in the nine weeks' terms as was usually accomplished in twelve weeks. Such, however, did not prove to be the case. Partly because of the shortened terms and partly because of the general unrest still prevailing among the students, the academic year of 1917-18 was not entirely satisfactory.

Arrangements were made for the College year in 1918 to begin September 25 and close approximately the first of June, 1919. But the lowering of the draft age in the summer of 1918 and the organization of the Student Army Training Corps made it necessary to abandon this plan. College opened, however, September 25, and when the Student Army Training Corps was disbanded, in December, it was decided to continue the College year on the usual basis of terms of twelve weeks. The second term opened December 30, 1918, and the College year closed June 24, 1919.

Liberal allowances were made by the faculty to students returning to College from military service at the beginning of the second term of this year, and the number coming back was most gratifying. At the beginning of the fall term of 1919 over 100 students, whose college education had been interrupted on account of the war, returned to resume their academic training.

### ADJUSTMENTS OF STUDENT ACTIVITIES

All athletic activities were suspended with the outbreak of the war in April, 1917. It became apparent that it would not be feasible to organize a football schedule for that fall. Intercollegiate hockey, basketball and track were conducted in the year 1917-18, but owing to the early closing of the term in 1918, no intercollegiate base-

ball schedule was arranged. In the fall of 1918, with the S. A. T. C. on the campus, it was inadvisable to organize intercollegiate sports. With the return, at the beginning of the second term 1918-19, to a normal conduct of affairs, all forms of intercollegiate athletics in which the College had participated before the war were resumed. In the year 1917-18 interclass and intergroup athletics were encouraged, and in the fall and spring represented the main athletic interest on the campus.

The "Collegian" was continued as long as was possible in the spring of 1917. During the summer supplements to the "Collegian" were from time to time issued by a group of students working at the College, assisted by members of the faculty. These contained news of Aggie men as well as letters from them, and were mailed to students engaged in agricultural or military service. The paper was published through 1917 and 1918 without serious interruption. In the autumn of 1918 there was substituted for the College senate a student council which, during the first term, functioned as would the regular Senate.

### COMMENCEMENT IN 1917 AND 1918

Members of the senior class began to leave College in March, 1917, and all had by the latter part of May secured positions away from the College, either in military service or in some form of agricultural mobilization. Necessarily the usual plans for Commencement had to be abandoned. It seemed desirable, however, to arrange for simple Commencement exercises, and to secure the attendance of as many as possible of those entitled to diplomas. Saturday evening, June 30, was set aside for the affair. The degree of bachelor of science was conferred upon one hundred and three men and one woman. Of this number, sixty-five returned to receive their diplomas in person. Nearly all of those who were unable to return were in military

camps, although a few were engaged in important agricultural enterprises from which they could not be spared even for a day. To those who could not be present the diploma was sent by mail.

There was a dinner at Draper Hall to which seniors and members of the faculty were invited. The attendance was nearly one hundred. Following the supper there were informal speeches by the President, the Dean, and representatives of the graduating class. At 8 o'clock the formal Commencement exercises were held in Bowker Auditorium; this program consisted of music, a brief address by the President, and the awarding of the diplomas.

Owing to the fact that so many members of the class who would have graduated in 1918 were absent in war service, it was thought advisable to arrange a simple and yet dignified Commencement program. The date set for this occasion was Saturday, April 27. Commencement was held in the forenoon in Bowker Auditorium. President George C. Creelman of the Ontario Agricultural College gave an interesting address on "The Duty of the Trained Agriculturist in the Present Crisis and After." Brief remarks were made by Lieutenant-Governor Calvin Coolidge, and the degrees were awarded by the President. Following these exercises an informal reception was held for the seniors and their friends, and a luncheon was given at the dining hall to one hundred and fifty seniors, guests, and members of the faculty. Altogether, it was felt that the plans as carried out met the situation admirably. There were forty-two seniors present to receive their degrees in person, three of this number being women. In addition, twelve degrees were awarded to members of the class who had attended the institution during the year, but were at that time absent on war service. Over one hundred seniors under normal conditions would have graduated in 1918.

### STUDENT ARMY TRAINING CORPS

On May 8, 1918, the War Department announced its plan for establishing a Student Army Training Corps in practically every American college. This plan provided for the enlistment in the army of boys from eighteen to twenty-one years old, and their assignment to colleges for one, two, or three years, and, under certain conditions, for even a longer period. The purpose was to maintain the normal attendance at the colleges, and at the same time to train men for officers and for certain expert service required in the army.

The modification of the selective service law in August, whereby the draft age was lowered to eighteen, would have depleted almost to the last man the attendance at the men's colleges. Consequently the regulations of the S. A. T. C. were immediately adjusted to meet the new situation. The Massachusetts Agricultural College accepted the opportunity to operate under the provisions of the S. A. T. C., which may briefly be stated as follows: Men formerly enrolled in the College, and those between the ages of eighteen and twenty-one who were able to meet the entrance requirements, were allowed to enter college as usual in the autumn. These men were inducted into the army as regular soldiers, and as such received \$30 per month, — the pay of privates, — and were clothed, housed, fed, and trained at government expense. A contract was made with the institution for the housing, feeding, and medical care of the men. The War Department furnished the necessary military staff. These soldiers were required to take military drill and certain academic subjects prescribed by the War Department. Such time as remained was to be utilized by the soldiers in the pursuance of such academic courses as they should choose.

At the outset we were given to understand that boys



twenty years of age would probably be allowed to remain in the College three months; nineteen years of age, six months; and eighteen years of age, nine months. The plan further contemplated distributing members of the S. A. T. C. at the end of each three months' period; their military and scholastic records would be examined, and, on the basis of these joint records, one of three things would be done with the man: (1) he would be sent to an officers' training school; (2) he would be allowed to remain at the College for further technical training; and (3) if he had shown no special aptitude, either for military work or for the technical training desired in the army, he would be transferred to a depot brigade as a private. Men thus transferred from the College were to be replaced by detachments assigned from depot brigades, which would be chosen as being qualified to benefit by three months' training in the S. A. T. C. The vacancies could also be filled by high school boys completing their course during the year. Had the war continued, the College would have become a permanent training camp, open the year round.

The final regulations by the War Department allowed the College to admit men who had completed, in any subject, fourteen units of high school work. On this basis a number of men were admitted to the S. A. T. C. who would not have been admitted as regular students.

The S. A. T. C. was formally established October 1, 1918. The College originally asked to be allowed to enroll three hundred and fifty men, but when the applications exceeded this number the quota was increased to four hundred; the total enlistment was three hundred and fifty-one, with twelve others taking the work as civilians. In addition to those registered as soldiers, there were seventy-three men and twenty-four women enrolled as regular students.

Early in October, by direction of the War Department, the best qualified members of the S. A. T. C. were trans-

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ferred to officers' training schools, and prior to November 12, sixty of these men were thus transferred. No other men, however, were assigned to take their places.

With the signing of the armistice on November 11 the plans for the S. A. T. C. were immediately interrupted. Finally, on November 27, it was announced that the S. A. T. C. would be disbanded not later than December 21, 1918.

Under the requirements of the S. A. T. C. certain educational experiments were undertaken, some of which seemed to represent the foundation of beneficial reforms in educational methods. Sufficient opportunity, however, was not given for the adequate testing of these methods.

In harmony with the expressed wish of the War Department that soldiers be housed under conditions approximating as nearly as possible the barracks arrangement at cantonments, the College utilized the dormitory rooms in North and South College, housing five to seven men in suites formerly occupied by two or three men. To supplement these accommodations certain rooms in French and Draper Halls were used. The soldiers were fed at Draper Hall.

This institution was especially fortunate in the personnel of the military staff which was assigned for the training of its soldiers. Too high praise cannot be given to the entire staff for their enthusiasm, efficiency, and qualities of leadership. The staff consisted of the following: Colonel R. H. Wilson (retired), who succeeded Captain Fleet as commandant, Captain G. E. Rifenbark, Lieutenants Curry S. Hicks (personnel officer), W. E. S. Dickerson, E. J. Costello, L. L. Cunningham, F. Dehls, D. C. Chalmers, J. T. Dave and Sergeant J. J. Lee (retired).

As soon as it was known that a detachment of soldiers would be stationed here a faculty committee was appointed to undertake such welfare work in behalf of the soldiers

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as should be required. Working in co-operation with this committee the international Y. M. C. A. placed on the campus a competent secretary, who did much to assist the soldiers and regular students. The Social Union room in North College was placed at the disposal of the committee, and was utilized as Y. M. C. A. headquarters.

### SUPPORT OF WELFARE WORK

The students and faculty participated most heartily in and contributed most generously to the work of the Red Cross and various other welfare agencies. In the autumn of 1917, when the campaign for the Y. M. C. A. was organized, the students voluntarily decided to try to raise \$5,000 on the campus. After the canvass, which was exceptionally well organized by the students and lasted less than two days, it was found that the total pledges from the faculty and students exceeded \$6,000. The students alone pledged nearly \$4,500. Ninety per cent of all students contributed, and their average subscription was approximately \$10. The response from the members of the staff was equally gratifying and generous.

During the campaign in November, 1918, our students and faculty again responded most liberally. The following summary of pledges made in this campaign indicates the whole-hearted interest and generosity of the College:

#### S. A. T. C.:

Company A, 145 out of approximately 150 pledged	. \$1,650 00
Company B, 147 out of approximately 150 pledged	. 1,595 00

#### Non-military:

Men, 56 out of approximately 69 pledged	. . . . 423 50
Women, 31 out of 31 pledged	. . . . 343 00

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Total for 379 soldiers and students,	. . . . \$4,011 50
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110 faculty members pledged . . . . .	\$2,604 00
9 members of the military staff pledged . . . . .	255 00
52 clerks pledged . . . . .	291 50
47 mechanics, laborers and miscellaneous employees pledged . . . . .	363 00
From girls' sorority . . . . .	50 00
<hr/>	
Total for the institution, . . . . .	\$7,575 00

### PARTICIPATION IN LIBERTY LOAN CAMPAIGNS

Students and faculty alike co-operated most loyally in all the Liberty Loan campaigns; not only did they make generous subscriptions, but many served successfully as solicitors for funds.

### WAR WORK OF THE ALUMNI AS CIVILIANS

The records which are available indicate that M. A. C. graduates and former students did their full share as civilians in promoting war work and in meeting the demands for leadership and service which were constantly made during the war by the multiplicity of interests and organizations. While the records of the full service rendered are not available, still a sufficient number of reports have been received to indicate the extent of the activities which claimed their attention.

The many M. A. C. men who were engaged in farming rendered an important service in increasing the food production of the country by raising larger crops; also, about fifty M. A. C. men who were outside the draft age served as members of the Home Guard in their respective States.

The following list has been arranged in the order of the number of men associated with each classification, and the total number involved is in excess of two hundred and seventy-five:

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1. Chairmen of committees or other workers connected with campaigns for the sale of Liberty Bonds, for subscriptions for the Red Cross and for other welfare organizations.
2. Members of town or city public safety committees, including subcommittees on food production and conservation.
3. Chairmen, members, medical examiners, or legal advisers for draft boards.
4. Investigators for the Federal and State governments in connection with entomology, botany, and chemistry as related to food production and conservation.
5. County agricultural agents and other Extension workers.
6. Members of Federal, State, or local food administration organizations.
7. Engineers or construction foremen for the United States Housing Corporation and for the United States Emergency Fleet.
8. Manufacturers of explosives, munitions, and other war materials.
9. Directors of boys' and girls' garden clubs.
10. Civilian workers in the Ordnance Department of the United States Army.
11. Construction workers on army cantonments and shipbuilding establishments.
12. Four-minute men.
13. Garden supervisors.
14. Farm bureau directors.
15. Members of boards for fuel administration.
16. Members of committee on education of the Council of National Defense.
17. Workers in United States armories.
18. Members of American Protective League.
19. Leaders in Boys' Working Reserve.
20. Workers in connection with the National Research Committee.
21. Milk Administrator for New England.

### SPECIAL WORK OF M. A. C. MEN

Many M. A. C. men, both alumni and faculty, were, during the war, called into special service, either in connection with the army or with certain civilian organizations. Some of the more important assignments are here mentioned.

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President Kenyon L. Butterfield served as chairman of the Massachusetts Food Committee, as a member of the advisory committee of the Food Administrator of Massachusetts, as a member of the educational committee of the Council of National Defense, as a member of the International War Work Council of the Y. M. C. A., and finally, in the summer of 1918, was asked to go to France as a member of the Army Overseas Educational Commission, to take charge of the vocational educational work among American soldiers. He sailed for France November 30, 1918, and upon his arrival there began the organization of an immense educational enterprise.

In April the army took over this educational work and designated the members of the groups who had gone overseas to teach as the Army Educational Corps. President Butterfield gave the larger part of his time to the agricultural phase of education, and several interesting enterprises were developed.

The College of Agriculture at the A. E. F. University had a faculty of above fifty, and an enrollment of seven hundred students. The farm school, under the direction of H. J. Baker, '11, had a student body of two thousand five hundred. A number of agricultural students were sent to French and British institutions. A farmers' institute or Extension staff was organized, and it was estimated that not less than two hundred thousand soldiers were reached through this means. Five or six hundred farmers' clubs were organized in different parts of the army. An important conference on world agriculture was held just before the educational work closed, with delegates from Great Britain, France, Belgium, as well as the United States.

Associated with President Butterfield in this task were many of the ablest educators of America. He was also assisted by Professors Cance and McNutt of the College faculty, and by several graduates of the College who were

either in the A. E. F. or were taken over from America as civilians.

On October 30, 1916, Mr. Daniel Willard, 1882, was appointed by President Wilson a member of the advisory committee of the Council of National Defense, and served as its chairman. He was also chairman of the subcommittee on transportation and communication, and in that capacity brought about the organization of the Railroad War Board and the co-ordination of steam railroads for war purposes. He also arranged for the appointment of committees representing the different transportation agencies, such as electric railways, highways, inland rivers and canals, and through these committees obtained a much larger degree of co-operation than ever before.

On November 17, 1917, Mr. Willard was appointed chairman of the War Industries Board by President Wilson. Owing to serious transportation difficulties which developed in the eastern section of the United States because of the unusual severity of the winter, he resigned the chairmanship of the War Industries Board on January 11, 1918, in order to devote his entire time to the management of the Baltimore & Ohio property.

In October, 1918, Mr. Willard was commissioned Colonel of Engineers, and ordered to proceed immediately to France for extended service in connection with the Transportation Department, but owing to the termination of the war his services were not required, and he was honorably discharged December 2, 1918.

Mr. Harold L. Frost, 1895, a trustee of the College, served with the American Red Cross in France from March, 1918, to March, 1919. He was appointed agricultural adviser in the hospital farm garden service, and later served with the American Peace Commission in tabulating war damages in the allied countries.

Director William D. Hurd of the Extension Service was called to Washington to serve as assistant to the Secre-

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tary of Agriculture in formulating nation-wide projects for food production, conservation, and distribution. In this capacity he served from August 1, 1917, to March 30, 1918.

Major Arthur C. Monahan, 1900, for several years connected with the United States Bureau of Education, was, in the spring of 1918, assigned to the important task of organizing for the government the educational work to be done among American soldiers who had been wounded in the war. For the adequate carrying out of this program a number of base hospitals were organized as educational units, and the work was developed with notable success.

Colonel Joel E. Goldthwait, 1885, one of the leading orthopedic surgeons in the country, soon after the outbreak of the war, was asked by the government to recruit a staff of specialists and go to France to help meet the critical situation there. For twenty-two months he served overseas, and his services were officially recognized by the British government.

### FEDERAL BOARD FOR VOCATIONAL EDUCATION

After the fighting had ceased, the Federal Board for Vocational Education in this country assumed the responsibility of taking disabled soldiers and sailors and so training them as to make it possible for them, in spite of their physical disability, to become self-supporting either entirely or in part. The program contemplated placing these men in colleges, universities, and trade schools where they might obtain the necessary training. Hundreds of these men expressed the desire to fit themselves for some form of agricultural work, and the Massachusetts Agricultural College was selected as the institution in the New England States where men from this section should be assigned. The first of these men came to us in the spring of 1919; in the fall of 1919 about two hundred men



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registered, and since that date others have been sent from time to time.

A few of these men have enrolled in the regular four-year course, many others have entered the two-year course in agriculture, while others, whose aims could best be met by special courses, have entered in so-called unit courses. Altogether, in the last two years four hundred and seventeen students have enrolled at the College under the direction of the Federal Board for Vocational Education.

### THE AMERICAN UNIVERSITY UNION IN EUROPE

Soon after the United States entered the war, a group of college representatives in this country organized what was known as the American University Union in Europe. Headquarters were established at Paris and at London. The purpose of the Union was to furnish hotel accommodations to the extent of its capacity for members of those institutions belonging to the Union. The prices for lodging and for meals were much lower than those in other hotels. The Union also furnished social and recreational headquarters, and in general supplied many needs of American university and college men who were in Europe for military and other service for the cause of the Allies. The Associate Alumni of the Massachusetts Agricultural College subscribed \$100 toward the maintenance of this organization, which entitled M. A. C. men to the advantages of the Union. Many of our men took advantage of these opportunities and testified to the high value of the service rendered by the Union.

### MEMORIAL SERVICE

In the spring of 1919 Dean Edward M. Lewis, who was acting president of the College, during the absence of President Butterfield in France, felt that there should be a memorial service in honor of those who gave their lives in

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the great war. The service was held in Bowker Auditorium at 3 P.M. on June 11, when the following program was presented:

Organ prelude.

Invocation . . . . . Rev. JOHN A. HAWLEY

Organ solo, Prelude in C Minor, . . . . . *Chopin*

Mrs. EDNA K. WATTS

Remarks in behalf of the Trustees . . . Mr. CHAS. A. GLEASON

Vocal solo, "Lest We Forget," . . . . . *De Koven*

Mr. HARLAN N. WORTHLEY

Remarks in behalf of the alumni, . . . Dr. JOSEPH B. LINDSEY

Organ solo, Prelude and Fugue in G, . . . . . *Bach*

Mrs. EDNA K. WATTS

Remarks in behalf of the Faculty, . . . Dean EDWARD M. LEWIS

Vocal solo, "The Americans Come," . . . . . *Fay Foster*

Mr. HARLAN N. WORTHLEY

Benediction . . . . . Rev. JOHN A. HAWLEY

Organ postlude.

The relatives and friends of the dead heroes were invited and the families of seventeen were represented. It was a beautiful and typical June afternoon, and the service was dignified and impressive.

Extracts from the addresses made by Hon. Charles A. Gleason, Dr. Joseph B. Lindsey and Dean Lewis may be found on pages 195 to 203.

### MEMORIAL HALL

Just when and where this noble project was first conceived will never be known. And it will be better so. If by any chance its origin be traced hereafter to any single individual, let us hope that his name will never be revealed. It will be prouder and sweeter for us to believe, as we believe now, that it was born of many minds in many places, — minds welded together and inspired by one mighty love and by one great devotion.

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Such seem to be the facts as our minds revert back to the months and weeks following the signing of the armistice on November 11, 1918. Suggestions for a suitable memorial to commemorate the fine record of the College in the war were heard soon after the booming of the cannon had ceased. By January, 1919, the question was openly raised by students, alumni, and members of the faculty, and the weeks following revealed a constantly increasing interest and discussion.

Dean Lewis invited a group of the alumni to meet with him at the Boston City Club on April 14 to consider the memorial proposition and various other matters of vital interest to the College. As a result of this invitation, the following met with Dean Lewis:

Atherton Clark, '77.  
Homer J. Wheeler, '83.  
Joel E. Goldthwait, '85.  
Evan F. Richardson, '87.  
George B. Willard, '92.  
Charles A. Peters, '97.  
Herbert W. Dana, '99.  
Arthur W. Gilbert, '04.  
Harold F. Tompson, '05.  
Bertram Tupper, '05.

Willard A. Munson, '05.  
Ralph J. Watts, '07.  
Albert R. Jenks, '11.  
Percy W. Pickard, '11.  
Fred D. Griggs, '13.  
Edward C. Edwards, '14.  
William V. Hayden, '14.  
George B. Palmer, '16.  
Harold Aiken, '16.  
Roger W. Weeks, '18.

The suggestion which the Dean made relative to providing a suitable, dignified memorial appealed to those present as a project which should be at once undertaken. Plans were made for bringing together a somewhat larger group of M. A. C. men to consider this matter, and on April 28, some forty M. A. C. men again gathered and directed their thought toward a memorial of some kind. A smaller group of alumni met weekly in Boston and agreed that it would be worth while to place before the alumni for their consideration a plan looking toward the erection of a substantial memorial hall which should be used as headquarters for student activities. It was also

thought advisable to arrange a large alumni meeting in Boston some time before Commencement, when this project might be formally launched. This meeting took the form of a Memorial Rally to welcome home our war heroes and to commemorate the sacrifice of the M. A. C. men who died in the service of their country.

The date for the Memorial Rally was set for May 23. On that evening, two hundred and eighty-eight Aggie men met at the Boston City Club. This was the largest number of M. A. C. men ever gathered together for a banquet. Dr. H. J. Wheeler, '83, served as toastmaster. Addresses were made by Colonel Joel E. Goldthwait, '85, General Clarence R. Edwards, Dean Lewis and Dr. A. W. Gilbert, '04. During the evening the proposal for the erection of a suitable memorial building was made and discussed at length. Those present unanimously endorsed the project for raising \$150,000 for a memorial hall, subscribed \$20,000, and authorized the executive committee of the Associate Alumni to appoint a committee to secure plans for the building and to direct a campaign for the raising of necessary funds among the alumni of the College. Mr. James H. Ritchie, who has been the College architect for several years, volunteered to serve as architect for the building, and to charge only one-half the usual commission for such work.

The executive committee appointed the following as a memorial building committee:

Atherton Clark, '77.  
J. E. Goldthwait, '85.  
E. F. Richardson, '87.  
W. L. Morse, '95.  
H. W. Dana, '99.  
A. W. Gilbert, '04.  
J. W. Gregg, '04.  
S. B. Haskell, '04.  
H. F. Tompson, '05.  
E. G. Bartlett, '07.

J. A. Hyslop, '08.  
P. W. Pickard, '11.  
T. J. Moreau, '12.  
F. D. Griggs, '13.  
E. C. Edwards, '14.  
G. B. Palmer, '16.  
A. W. Spaulding, '17.  
Fred C. Kenney, Treasurer of the  
College.

Subsequently Dean Lewis and Ralph J. Watts, '07, were added to this committee as *ex officio* members.

The memorial building committee met on June 9 and organized, with Atherton Clark, chairman, Arthur W. Gilbert, vice chairman, Fred D. Griggs, secretary, and Fred C. Kenney, treasurer. Provision was made for organizing a campaign for funds and for the completion of the architect's drawings. On June 30, A. W. Spaulding was formally placed in charge of the financial campaign, and he immediately entered upon this task with characteristic energy and enthusiasm. Briefly stated, the plan of campaign was as follows:

Subscriptions were asked directly by the campaign manager, and the appeal reinforced by class leaders or secretaries and by representatives of local clubs. The appeal was made for every M. A. C. man to make a contribution, and class quotas were assigned on the basis of \$100 for each living graduate. In order to make it as easy as possible for individuals to make such pledges, it was proposed that payments be made in four installments on the following dates: January 1, 1919; July 1, 1920; July 1, 1921; July 1, 1922. On October 1 the campaign was formally launched.

Mr. Willard A. Munson, '05, and Mr. Howard L. Russell, '18, on that date addressed the students of the College and made an appeal for their loyal support of the project. As a result, \$26,000 was raised by the students within twenty-four hours. Practically every member of the student body, including special and two-year students, subscribed. Previous to this date campaign literature had been sent to all M. A. C. men. An illustrated pamphlet describing the proposed building had been prepared, and this, together with the pledge blank and a general appeal, reached each M. A. C. man on or about October 1. Mr. Munson and Dean Lewis took an extended trip into the West in the interest of the campaign; they met

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individuals and groups of alumni as far west as San Francisco and Los Angeles.

The pledges came in freely during October, as the result of an intensive mail campaign that reached alumni in every part of the world. On October 25 a World Aggie Night was arranged in over twenty-five cities and towns in the country. On this date six hundred M. A. C. men gathered simultaneously, and as a result practically all of the fund of \$150,000 was pledged.

By this time plans and specifications for the building were ready, but the committee was still confronted with the problem of financing the construction of the building until such time as the pledges should be paid. Through the influence of Mr. Clark, chairman of the committee, the committee was advised on December 13 that the American Trust Company of Boston would lend the Associate Alumni the necessary funds on notes signed by the corporation. On this date, also, the contract for the building was awarded.

Following is an analysis of the amounts and sources of the pledges made towards the Memorial Building Fund:

SIZE OF PLEDGES.	Number.	Alumni and Former Students.	Students.	Relatives of Boys who died in the War.	Friends.	Faculty.	Amount.
\$5,000, . . . . .	2	2	-	-	-	-	\$10,000
\$2,000, . . . . .	1	1	-	-	-	-	2,000
\$1,000, . . . . .	4	3	-	-	1	-	4,000
\$500 to \$1,000, . . . . .	4	4	-	-	-	-	2,900
\$500, . . . . .	26	23	-	-	2	1	13,000
\$300 to \$500, . . . . .	8	6	-	1	1	-	3,070
\$100 to \$300, . . . . .	117	112	10	-	1	4	23,800
\$100, . . . . .	500	414	65	5	1	15	50,000
\$50 to \$100, . . . . .	161	85	73	-	1	2	10,345
\$50, . . . . .	306	168	121	2	2	13	15,300
Under \$50, . . . . .	767	376	351	4	5	31	16,557
Miscellaneous, . . . . .	-	-	-	-	-	-	323
	1,896	1,184	620	12	14	66	\$151,295

A study of this schedule indicates that 62 per cent of the total number of pledges was made by alumni, 33 per cent by students, and 5 per cent by the faculty, friends of the College, and relatives of the boys who died in the war; 77 per cent of the total amount was subscribed by alumni, 18 per cent by students, and 5 per cent by faculty, friends, and relatives. Subscriptions were received from 67 per cent of the living graduates whose addresses are known and from 35 per cent of the non-graduates.

It is of interest to note that only 20 per cent of the total came from subscriptions of \$500 or over, whereas one-third of the total was the result of five hundred pledges of \$100 each, and nearly another one-third came as the result of individual pledges of less than \$100 each.

Subscriptions came from alumni living in Cuba, Porto Rico, Hawaii, Philippine Islands, South Africa, British West Indies, Malay Free States, Turkey, Mexico, Japan, Santo Domingo, Canada, Serbia, Costa Rica, Brazil, and from many boys still in the Army in France and Germany. The subscriptions from friends of the College came without solicitation, and the total added to the fund from this source was considerable.

To the Class of 1905 should be given the credit for being the first to subscribe its full quota, not only of the total assigned but of 100 per cent of individual subscriptions.

Each of fifteen M. A. C. men who were in Amherst during the summer, many of whom had been overseas and some of whom had been wounded, subscribed his State bonus of \$100 toward this project, and issued an appeal to his comrades to support the fund to the limit of their ability.

The success of the campaign was due in no small part to the leadership of A. W. Spaulding, who served as the executive manager from July, 1919, to February, 1920. Mr. G. M. Campbell, '20, who succeeded Mr. Spaulding, was untiring in his efforts in following up the work done

by Mr. Spaulding, in securing further subscriptions, and in securing the payments of pledges already made.

Ground was broken for the building March 30, 1920. The corner stone was laid Sunday, June 20, following the Baccalaureate address to the senior class. A large number of students, alumni, faculty, and friends of the College met on this occasion. Addresses were made by Mr. Atherton Clark, Mr. William Wheeler, and Dr. Joel E. Goldthwait. The building will be dedicated at the 1921 Commencement.

The alumni propose to deed the building to the College, providing that the College shall maintain it perpetually for the purposes designated. The management of the memorial building is vested in a committee known as the Board of Managers of Memorial Hall. The committee is created jointly by the Associate Alumni, the President and Trustees of the College, and the Student Senate. The duties of the Board are:

1. To manage the building in harmony with the designated purpose of the donors.
2. To have charge of the building with respect to conduct, and to be responsible for its proper use and upkeep.
3. To assign offices to the various student activities, and to regulate the dates of public affairs held in the auditorium and social room.

The first Board of Managers is composed of the following:

Two students appointed by the Senate: Nathan W. Gillette, '21, and Henry S. Moseley, '22.

Three alumni appointed by the Associate Alumni: Sumner R. Parker, '04, Raymond H. Jackson, '08, and Enos J. Montague, '15.

Two members of the faculty appointed by the President: Professors Joseph S. Chamberlain and A. Victor Rice.

The Treasurer of the College, *ex officio*, as general custodian of College property: Fred C. Kenney.

The President of the College, *ex officio*, representing the Trustees: Kenyon L. Butterfield.



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The appointment of members is made annually for terms of one year. The Board meets annually in September (or in June), and elects such officers as it may consider necessary.

In determining to raise by subscription sufficient funds to erect a suitable war memorial, the alumni of the Massachusetts Agricultural College were pioneers in a practice which has since become quite common among American colleges. A careful investigation indicates that no other college or university in this country preceded ours in beginning construction on a memorial building.

The Memorial Hall enterprise was a daring one. Our alumni are not numerous, very few have great wealth, and besides, they had never before been asked to subscribe any large amount of money for any college purpose. A few alumni felt that it was unwise to launch the drive at the time proposed, and some were skeptical of its success. On the other hand, there were a small group of alumni who, from the outset, had enthusiasm, courage, and faith to believe that the inspiring record of the College during the war would furnish sufficient incentive to insure success. Every one had faith in the loyalty and love of the alumni for their Alma Mater and believed that a large percentage of the graduates would gladly make the sacrifice necessary to erect a creditable memorial. The belief and faith of those who early supported the movement has been amply justified, and the College will always feel proud of this great achievement. It marks the beginning of a new relationship between the College and her graduates.

### MILITARY RECORD

In this volume are printed the individual records of M. A. C. men who served in the World War. There are also certain lists and tabulations which may assist in a better appreciation of the part which our men had in the great struggle. The data here assembled are the result

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of the endeavor which the Secretary of the College has put forth since the summer of 1917 to collect and preserve all the records available. They are necessarily incomplete, and there may be some inaccuracies. It has been extremely difficult to secure exact data and quite impossible to obtain everything. The following are appended:

List of men who gave their lives in the World War, with records and available photographs.

List of men who served as members of the army and navy, with individual records.

List of men who served officially with the Red Cross and welfare organizations, with individual records.

List of commissioned officers.

Summary, by classes, of men in service, number of commissioned officers, number serving overseas and casualties.

Analysis of men in service from classes of 1913 to 1922.

Selected letters and other memoranda of interest.

It is quite natural that the representative of any college or university who has known intimately its war history, and who is preparing a permanent record of such, should feel that the war record of his particular institution is the best of any in the land. No such claim is here to be voiced, because we well know that every American college and university made a response to the demands of the hour which will forever stand as an eloquent testimonial to the whole-hearted loyalty and patriotism of those young men of our land who frequently are classed as the "elect of society." But it may be fairly challenged whether any college in the country has, on the whole, a prouder war record than has the Massachusetts Agricultural College, — a total of 1,304 students, graduates, former students, and faculty in war service; 446 commissioned officers; 454 overseas; and 51 deaths. This briefly is the proud record.

Of these fifty-one casualties, forty-eight resulted from

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service with the United States military forces, one with the American Y. M. C. A., one with the British Army, and one with the French Army.

Twenty-seven were killed in action or died as the result of wounds while serving in the American Army; eleven died from disease in American camps; four died in France from disease resulting from military service; four were killed in air-plane accidents in America; one died from disease in England; one was killed in action while serving with the French Army, one with the British Army, and one with the Y. M. C. A.; and one was killed by accident in France after the signing of the armistice.

Of the thirty-four who were killed in action or died as a result of military service in France, one death occurred in 1914 while serving with the French army; one in 1916 with the British Army; five between April 20 and July 1, 1918, with the American Army; twenty-one between July 1 and November 11, 1918, with the American Army; and six after the armistice was signed.

Of the so-called major operations of the war, M. A. C. men participated in every one.

A further analysis of the statistics reveals the fact that of all the men entering the institution in the classes from 1913 to 1922, inclusive, 1,058, or 66 per cent, were in war service, and of the 844 men entering in the classes of 1917, 1918, 1919, 1920 and 1921 there were 639, or 76 per cent. Of the total of 1,304 who were in war service, 81 per cent were from the classes of 1913 to 1922, and 49 per cent were from the classes of 1917 to 1921.

Attention should be directed to the fact that a number of the younger graduates of these classes were exempted from military service on occupational grounds, because they were engaged in agricultural production or because they were serving in agricultural teaching, research, Extension work, or were in State or Federal employ as agricultural specialists.

On the other hand, many graduates who unquestionably could have secured deferred classification because they were married, or on occupational grounds, waived this consideration, and early in the war volunteered for military service.

Those who by long association with college men are familiar with their enthusiasm, zeal for adventure and self-sacrificing spirit in critical hours fully expected that they would be the first to throw themselves wholeheartedly into the world struggle. But not even members of the faculty correctly anticipated the effect which America's participation in the war would instantly have upon our students. During the first year of the war the President, the Dean, and others near to the students, endeavored to convince them that until they were drafted their best service to their country would be to secure all the college training possible as a preparation for admission to an officers' training school, or for other posts of leadership. This appeal resulted in complete failure, because these young men could not be convinced that their place was elsewhere than with the actual fighting forces on land or on sea. We saw these boys — they seemed to be mere boys then — go out from their college work; we saw scores of our young alumni leave their peaceful occupations, all with complete abandon. Later we saw these same boys — transformed in a few months into men — return and resume quietly their old-time pursuits; we saw many return disabled and broken in body, and we looked in vain for the faces of those who will never return. And to us there came an inspiration and a vision of the splendid, heroic manhood of our country which we can never forget; and even yet we are not able to appreciate the full significance of the patriotism and self-sacrifice of our College boys, and we meditate on the great event, not only with great pride and admiration, but also with reverence and awe.

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# OUR HONORED DEAD

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## WE ARE THE DEAD

*(In memory of the Aggie men who gave their lives in the Great War.)*

The lights of old South College one by one  
Blossom in fire; across the quiet Pond  
A murmur stirs and whispers and is gone,  
The North Star shines on Toby; and beyond  
The sorrow and the heartache and the scars  
Wheel the inviolable squadrons of the stars.

Across the shadows drifts the undertone  
Of laughter and of music and of talk;  
Great schemes are hatching, building stone by stone  
The future, and deep friendships where men walk  
Smoking along the paths where once before  
Strolled the undaunted dead we see no more.

Whether we faced them from the lecturer's chair  
Or shoulder to shoulder listened in the seats,  
We know one golden lad of yellow hair  
Walks on the wind and still his comrades greets,  
And all the gay young faces that we knew  
Have only changed to let the light shine through.

They are not dead, they do not, cannot die,  
They are as near us, nearer than before;  
'Tis only we who have so dim an eye  
We cannot see them stamping out the door  
Playing at ball and laughing deep and clear;  
Only our ear is dull, we do not hear.

About the Chapel still the ivy shades  
The graven numbers of each scattered class,  
Never again to gather for those raids  
That shocked the village when they came to pass;  
And now we build a structure that will keep  
Alive our dead who in the Argonne sleep.

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Their bodies rest outwearied with the day;  
Hunger and thirst and agony they knew;  
Dying they smiled, for suffering could not slay  
The love they bore, the faith they held so true:  
And now they bid us still be comforted  
Knowing they live — 'tis we who are the dead.

— WILLARD WATTLES, Lawrence, Kansas,  
*Instructor in the Massachusetts Agricultural College, 1911-14.*



# Our Honored Dead



## WINDOM ALPHEUS ALLEN, Faculty

Dalton, Mass.

Assistant chemist at the Experiment Station from March, 1916, to September 16, 1917, when he was granted a leave of absence to enlist in the Chemical Warfare Service. He was stationed at Camp Devens where he was promoted to the rank of corporal in October, 1917. Later he was transferred to Washington, D. C. He died of pneumonia at the New Haven Army Hospital January 31, 1919.

## DEXTER EDWARD BAILEY, 1910

Tewksbury, Mass.

Enlisted March 1, 1918, in the Food Division, Sanitary Corps. March 19, 1918, he entered the Medical Officers' Training Camp at Camp Greenleaf, Ga., where he was commissioned first lieutenant. Later he was transferred to Camp Bowie, Fort Worth, Texas, as nutrition officer, and died there of pneumonia December 2, 1918.

## JOHN WATLING BRADLEY, 1914

Groton, Mass.

Enlisted November 27, 1917, in the Air Service, and was stationed at the Ground School, Massachusetts Institute of Technology. Later he was transferred to Princeton, N. J., and from there to Camp Dix, Texas; he was again

## **M. A. C. IN THE WAR**

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transferred to Wilbur Wright Field, Dayton, Ohio, where he was commissioned second lieutenant. He was killed in an airplane accident at Wilbur Wright Field July 4, 1918.

### **LOUIS CARMEL BROWN, 1910**

**Bridgewater, Mass.**

Enlisted January 5, 1918, in the Engineers' Reserve Corps, and was commissioned first lieutenant. He sailed for France June 29, 1918. He served in Company A, 601st Engineers, and Company D, 7th Engineers, and fought at St. Mihiel and in the Meuse-Argonne offensive. He was wounded in action at Cunel on October 14, 1918, and died in Mobile Hospital No. 1, at Fromerville, October 18, 1918. He was cited for bravery in action on October 14, 1918.

### **PAUL TENHAGEN BUCK, Unclassified**

**LaGrangeville, N. Y.**

Enlisted December 15, 1917, and was a member of the 8th Company, 2d Motor Mechanics Regiment. He was promoted to the rank of sergeant on November 9, 1918. He sailed for France March 4, 1918, and was killed May 24, 1919, in an automobile accident at Châlons-sur-Marne.

### **THOMAS EDWARD CARTER, 1918**

**West Andover, Mass.**

Enlisted January 5, 1918, entered the Officers' Training School at Camp Upton, New York, and sailed for France in the spring of 1918. He served in Company G, 308th Infantry, and later in Company L, 9th Infantry. He was commissioned second lieutenant June 1, 1918, and was killed in action November 4, 1918, near La Tuilerie Farm. For bravery in action he was awarded the following French citation: "During the advance at Medeah Farms he displayed the greatest coolness and excellent qualities as chief, by capturing with his section sixty prisoners and several

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machine guns." Also this American citation: "He distinguished himself by extraordinary heroism in connection with military operations against an armed enemy of the United States at Tuilerie Farm, France, on November 4, 1918, and in recognition of his gallant conduct I have awarded him in the name of the President, the Distinguished Service Cross. JOHN J. PERSHING, December 6, 1918."

### RAYMOND CHAMBERLIN, 1916

Brookline, Mass.

Enlisted May 28, 1917, and was assigned to Company A, 102d Machine Gun Battalion, 26th Division. He sailed for France in September, 1917, and fought at Seicheprey, the Marne, Epieds and St. Mihiel. He was killed in action at Marcheville September 26, 1918.

### ROBERT HENRI CHAPON, 1914

Paris, France.

Enlisted in September, 1914, in Paris in the infantry of the French Army, and was killed December 30, 1914, in action near Verdun. He was the first M. A. C. man to give his life in the World War.

### CHARLES HENRY CLOUGH, 1917

Dedham, Mass.

Enlisted October 10, 1917, and was assigned to the Headquarters Detachment, 60th Brigade, Infantry. He died of pneumonia April 13, 1918, in Liverpool, Eng.

### EDWIN PRINCE COOLEY, 1919

Sunderland, Mass.

Enlisted January 5, 1918, and entered the Officers' Training School at Camp Upton, New York. He was assigned to Company G, 306th Infantry, 77th Division, and sailed

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for France April 14, 1918. He was in training with the English in northern France for six weeks. He fought at the Marne, Fismes and Bazoches, and was killed at Bazoches August 27, 1918. It is reported that in the engagement in which he lost his life, only seventeen men returned out of the one hundred and eighty-nine who participated.

### WALTER IRVING CROSS, 1917

Hingham, Mass.

Enlisted January 17, 1918, and was assigned to the Supply Company, 61st Infantry, and later to the Ordnance Department, 61st Infantry. He sailed for France April 14, 1918, and was with the Army of Occupation in Luxembourg, where he died of pneumonia February 27, 1919.

### ERNEST LANGFORD DAVIES, Graduate Student

Guelph, Ontario, Canada

Graduate assistant in microbiology from September 1, 1913, to November 15, 1914. Soon after the outbreak of war he twice endeavored to enlist, but owing to the need for an operation was not passed by the medical authorities. During 1915 he took the work of the Officers' Training Corps at the Ontario Agricultural College, and later successfully underwent the operation necessary to pass the medical authorities for active service. He first joined the 29th Battery at Guelph in November, 1915. Later he qualified as lieutenant in the infantry and was assigned to the 153d Wellington Battalion. During the early months of 1916 he was stationed at Fergus, recruiting and training men for the 153d. Later he passed the necessary examination for a captaincy. On August 19, 1916, he sailed for England, and soon was sent to France and assigned to the 87th Montreal Battalion, then in action. On October 21, 1918, while in his second action with this battalion, he was killed.

## M. A. C. IN THE WAR

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### **ELSTON ALMOND DAY, 1919**

**Northbridge, Mass.**

Enlisted July 24, 1918, and was assigned to Company A, 74th Infantry. He was promoted to the rank of corporal September 1, 1918, and served also as company clerk. He died of pneumonia at Camp Devens September 26, 1918.

### **THOMAS WHITTY DESMOND, 1919**

**Randolph, Mass.**

Enlisted in August, 1917, and entered the Second Plattsburg Training Camp, where he was commissioned first lieutenant. He was assigned to Company D, 18th Infantry, 1st Division, and sailed for France in January, 1918. He was killed in action May 27, 1918.

### **DAVID OLIVER NOURSE EDES, 1918**

**Bolton, Mass.**

Enlisted January 5, 1918, entered the Officers' Training School at Camp Upton, New York, and was assigned to Company L, 131st Infantry. He sailed for France in April, 1918, and was there commissioned second lieutenant June 1, 1918. He was killed in action in Gressaire Wood August 9, 1918.

### **ALFRED AUSTIN FARWELL, 1917**

**Turners Falls, Mass.**

Enlisted in September, 1917, and attended the Second Plattsburg Training School, where he was commissioned second lieutenant, infantry, November 27, 1917. Later he was promoted to the rank of first lieutenant. He sailed for France January 29, 1918, being attached to the 1st Trench Mortar Battery, 6th Field Artillery, 1st Division. From February 5 to April 30, 1918, he was in the Field Artillery School of Instruction at Saumur, France. He

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fought at Cantigny, Soissons and Château-Thierry. He was shell-shocked and gassed. He returned to the United States in December, 1918, and died at Camp Merritt December 29, 1918.

### WARREN FRANCIS FISHERDICK, 1912

Amherst, Mass.

Enlisted in June, 1917, as a member of Company F, 16th Railway Engineers. He sailed for France in August, 1917, and was promoted to the rank of sergeant in November, 1918. He died of disease in Base Hospital No. 79, Bazilles Sur Meuse, February 20, 1919.

### WILLIAM PATRICK FITZGERALD, Unclassified

Worcester, Mass.

Enlisted in March, 1917. He served as first lieutenant in Company M, 101st Infantry, 26th Division. He sailed for France in November, 1917, and fought at Chemin-des-Dames, La Reine Boucq and Pas Fini. He was killed in action at Verdun July 15, 1918.

### HAMILTON KNIGHT FOSTER, 1918

New Rochelle, N. Y.

Enlisted August 21, 1916. He was first lieutenant in Company A, 26th Infantry, 1st Division. He sailed for France June 13, 1917. On August 10, 1917, he was promoted to the rank of captain. He was in the training camp, Toul sector, from June to October 30, 1917. He fought at Cantigny, Soissons and in the second battle of the Argonne. He was wounded at Soissons, and was killed in the battle of the Argonne October 4, 1918.

For bravery in action he was awarded the following American citations: "Showing utter disregard of his personal safety he led his company over the top. Being held up by a strong machine gun nest, he displayed excellent judgment, making it possible for the nest to be cleared out.

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He was wounded during the action. B. B. BUCK, Brigadier-General." Special citation awarded posthumously by the commanding general: "Extraordinary heroism in action in France July 22, 1918. A courageous and inspiring leader at all times. During the fighting near Soissons he particularly distinguished himself for bravery and judgment." The Distinguished Service Cross was awarded posthumously.

The King of Italy also conferred upon him posthumously the Italian War Cross for Merit. The Cross was accompanied by the following letter: "His Majesty the King of Italy, Victor Emmanuel III, has deigned to confer on you the Italian War Cross for Merit, which I include. The King of Italy has wished that this decoration, which in Italy is given to reward those who most distinguish themselves in action, should be awarded to you in recognition of the gallantry you have shown and of the merit you have thereby acquired for the common cause, even though you have not fought on Italian soil. I. PERELLI, Brigadier-General."

### **CARROLL EDWARD FULLER, Unclassified**

**Portland, Me.**

Enlisted July 25, 1918, was a member of Company L, 74th Infantry, 12th Division, and died of pneumonia at Camp Devens September 26, 1918.

### **LAURENCE WASHBURN GAY, 1919**

**Groton, Mass.**

Enlisted July 25, 1917, and was a member of Headquarters Company, 101st Field Artillery, 26th Division. He sailed for France September 27, 1917, and was promoted to the rank of sergeant in July, 1918. He fought at Chemin-des-Dames, Seicheprey, Xivray, in the second battle of the Marne, at Belleau Wood, St. Mihiel and Verdun. He was gassed at Verdun October 13, 1918, and died October 30, 1918, at Vichy.

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### **JOHN FARRAR GILES, Unclassified**

**Concord, Mass.**

Enlisted August 27, 1917, and was attached to Company C, 102d Infantry, 26th Division. He was promoted to the rank of corporal, and sailed for France in October, 1917. He was killed in action at Seicheprey April 20, 1918. He was the first M. A. C. man to be killed in action while serving with the American Army. He was cited for decoration after death.

### **AMOS FRANCIS HAMBURGER, 1908**

**Peterboro, N. H.**

Enlisted in August, 1917, attended the Second Plattsburg Training School, was commissioned first lieutenant, infantry, in September, 1918, and died of influenza at Camp Meade, Maryland, October 6, 1918.

### **WARREN TIMOTHY HARRIS, 1917**

**Millbury, Mass.**

Enlisted September 30, 1918, and died of pneumonia at Fort Slocum, New York, October 9, 1918.

### **WILLARD HARRISON HASEY, 1913**

**Campello, Mass.**

Enlisted August 25, 1917. He was in the Second Officers' Training School at Plattsburg from August 25 to November 26, 1917, when he was commissioned first lieutenant, infantry. He sailed for France January 4, 1918, and was assigned to Company E, 26th Infantry, 1st Division. He was wounded at Cantigny May 28, 1918, and was killed in action by a high explosive shell near Soissons July 19, 1918. He was recommended for the French Croix de Guerre.



## M. A. C. IN THE WAR

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### **WARREN SIDNEY HATHAWAY, 1920**

**Somerset, Mass.**

Enlisted January 5, 1918, and entered the Officers' Training School at Camp Upton, New York. He was a member of Company I, 308th Infantry, and later transferred to Company K, 23d Infantry, 2d Division. He sailed for France in April, 1918, and was commissioned second lieutenant July 17, 1918. He fought at St. Mihiel, and was wounded at Blanc Mont, in the Champagne sector, October 4 and died at Base Hospital No. 67 November 4, 1918. He was cited for distinguished and exceptional gallantry at Blanc Mont on October 3, 1918, in the operations of the American Expeditionary Forces.

### **EDWARD ASA HOOPER, Unclassified**

**Newton, Mass.**

Enlisted May 4, 1916, and served on the Mexican Border from June 19 to October 18, 1916. In May, 1917, he entered the First Plattsburg Training School, and on September 9, 1917, sailed for France, where he was assigned to the 101st Field Artillery, 26th Division. He fought at the Marne and Château-Thierry, and was killed in action July 29, 1918, near the Marne.

### **ROBERT BAKER HUTCHISON, 1913**

**Winter Hill, Mass.**

Enlisted March 29, 1918. He was a member of Battery E, 107th Field Artillery, 28th Division, and sailed for France May 17, 1918. He was killed in action near Villette, on the Vesle River, September 7, 1918.

### **HAROLD WILSON HYLAND, 1913**

**Weymouth, Mass.**

Enlisted January 5, 1918, entered the Officers' Training School at Camp Upton, New York, and was assigned to Company E, 127th Infantry. He sailed for France about

## M. A. C. IN THE WAR

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April 1, 1918, and was commissioned second lieutenant, in July, 1918. He died September 1, 1918, from wounds received in action.

### ROBERT PATTERSON IRVINE, 1918

Wilmette, Ill.

Enlisted June 6, 1917, was a member of 108th Engineers and later was transferred to Depot Detachment, 427th Engineers in which he served as sergeant. He died of pneumonia at Camp Logan, Houston, Tex., January 16, 1919.

### FORREST DEAN JONES, 1918

Worcester, Mass.

Enlisted November 1, 1917, in the Air Service and was in training at the Ground School, Massachusetts Institute of Technology, Cornell and Kelly Training Field. He was killed in an airplane accident at Kelly Field, Texas, April 16, 1918. He was to have received his commission upon the day of his death.

### TRUEMAN EUGENE KILE, 1921

Providence, R. I.

Was a member of the S. A. T. C. at the Massachusetts Agricultural College from October 10, 1918, until December. He died of influenza at his home in Providence, R. I., December 6, 1918.

### SAMUEL KOPLOVITZ, 1915

Chelsea, Mass.

Enlisted in December, 1917. He served in Battery D, 54th Coast Artillery Corps, and Battery A, 53d Coast Artillery Corps. He sailed for France August 18, 1918, and died of wounds near Verdun October 24, 1918.

## M. A. C. IN THE WAR

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### KENNETH BRADFORD LAIRD, 1916

Whitman, Mass.

Enlisted June 21, 1918. He was in the Army Medical School at Washington, D. C., and in the Yale Army Laboratory School, New Haven, Conn. He died of pneumonia at New Haven January 5, 1919.

### EDWARD ARTHUR LARRABEE, 1911

Medford, Mass.

Enlisted January 1, 1918, and entered the Officers' Training School at Camp Upton, New York. He sailed for France April 6, 1918, and was commissioned first lieutenant, infantry. He was assigned to the 9th Infantry October 30, 1918. He was wounded November 2, 1918, by a high explosive shell, and died in Base Hospital No. 115, Vichy, December 7, 1918.

### RALPH ROBY MACCORMACK, 1921

West Somerville, Mass.

Enlisted May 15, 1918, completed the ten weeks' course at the Massachusetts Institute of Technology on August 17, 1918, and went to Key West, Florida. Later he was transferred to Miami, and from there to Pensacola, where he was commissioned ensign, Naval Aviation, on December 11, 1918. He was killed at Pensacola in a seaplane accident February 7, 1919.

### JOHN ELMER MARTIN, Graduate Student

Mounds, Okla.

Enlisted December 7, 1917. He sailed for France in May, 1918, and served with the Medical Department, Evacuation Hospital No. 8, where he died of pneumonia December 12, 1918.

## M. A. C. IN THE WAR

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### JOHN RAYMOND MOORE, 1919

Tolland, Mass.

Enlisted September 22, 1917, and was assigned to 21st Company, 6th Battalion, Depot Brigade, and was later promoted to the rank of sergeant and transferred to Company C, 326th Infantry, 82d Division. He sailed for France April 28, 1918, and fought in the battle of the Argonne, where he was killed in action October 16, 1918.

### RALPH THOMAS NEAL, 1913

Auburndale, Mass.

Enlisted in January, 1918. He sailed for France and served as a lieutenant in the 9th Infantry. He was killed during the Blanc Mont Ridge attack, October 2, 1918. For bravery in action he received the following French citation, and was awarded the Croix de Guerre with Palms: "He gave proof of untiring energy in carrying out missions of liaison and of reconnaissance under violent bombardment, rendering important service to his company. He was killed while advancing near Medeah Farm."

### ARTHUR VICTOR PETIT, 1918

Amherst, Mass.

Enlisted September 6, 1917, and was a member of Company H, 30th Infantry, 3d Division. He sailed for France April 21, 1918, and fought at Château-Thierry, St. Mihiel, Verdun and in the Argonne. He was wounded August 10, 1918, and again October 9, 1918, in the Argonne Forest. He died of pneumonia January 8, 1919, at Base Hospital No. 8, Savenay, France.

### IVAN ANDREW ROBERTS, 1920

South Lee, Mass.

Enlisted in August, 1917. He was commissioned second lieutenant while at Fort Worth, Tex., and was a member of the 27th Aero Squad, 1st Pursuit Group. He sailed for

## M. A. C. IN THE WAR

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France in March, 1918. and fought at Château-Thierry, St. Mihiel and in the Meuse-Argonne. He was reported missing in action September 26, and died in a Prussian Hospital October 1, 1918. He was awarded the Croix de Guerre with Palms, and cited (posthumously) by Marshal Petain.

### **ERNEST FRANCIS SEXTON, 1919**

**Darien, Conn.**

Enlisted in May, 1917. He attended the First Plattsburg Training School, was commissioned second lieutenant, infantry, and was assigned to Company E, 23d Infantry, 2d Division. He sailed for France in September, 1917, where he was promoted to the rank of first lieutenant. He was killed in action at Premont June 4, 1918.

### **HALLIDAY SPENCER SMITH, 1910**

**Webster Groves, Mo.**

Joined the overseas contingent of the Y. M. C. A. as field secretary, and sailed for France in November, 1917. He was killed in action near Baccarat May 26, 1918.

### **CHARLES MARSH STREETER, 1913**

**Brimfield, Mass.**

Enlisted September 6, 1917, and served as a member of Battery B, 102d Field Artillery, 26th Division. He sailed for France in September, 1917. He fought at Chemin-des-Dames, Toul, Château-Thierry and St. Mihiel. He died October 16, 1918, in American Hospital No. 58, in Riman-court, Haute-Marne, from wounds received in action.

### **WILLIAM WALLACE THAYER, 1917**

**Winter Hill, Mass.**

Enlisted May 15, 1917, and attended the First Plattsburg Training School, where he was commissioned second lieutenant, infantry, August 15, 1917. He was assigned to

## M. A. C. IN THE WAR

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Company B, 301st Infantry, 76th Division, stationed at Camp Devens. He died of disease at Somerville, Mass., April 19, 1918.

### ROBERT CLAYTON WESTMAN, 1917

Roslindale, Mass.

Enlisted January 5, 1918, and entered the Officers' Training School at Camp Upton, New York. He sailed for France in April, 1918. He served with Companies I and K, 306th Infantry, 77th Division, and later was commissioned second lieutenant and transferred to Company F, 131st Infantry, 33d Division. He died August 10, 1918, from wounds received in action at Chipilly Ridge on August 9.

### FRANCIS WELLINGTON WHITNEY, 1913

Needham, Mass.

Enlisted January 5, 1918, and entered the Officers' Training School at Camp Upton, New York. He sailed for France in April, 1918. He was commissioned second lieutenant June 1, 1918, and attached to Company C, 131st Infantry, 33d Division. He was wounded October 12, 1918, and died in Base Hospital No. 53 on October 18 from wounds and gas infection.

### CHARLES RAYMOND WILBER, 1917

Walpole, Mass.

Enlisted January 5, 1918, and entered the Officers' Training School, Camp Upton, New York. He sailed for France in April, 1918. He was commissioned second lieutenant July 19, 1918, and served with the 306th Infantry and later with Company B, 126th Infantry. He was wounded August 3, 1918, and killed in action in the Argonne Forest September 29, 1918.

## M. A. C. IN THE WAR

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### ALTON PALMER WOOD, 1911

**Boston, Mass.**

Enlisted May 1, 1917, and entered the First Plattsburg Training School. He was commissioned second lieutenant August 10, 1917, and attached to Company F, 167th Infantry, 42d Division. He sailed for France in November, 1917, and died May 4, 1918, from wounds received in action.

### WILFRED LIVINGSTONE WOODSIDE, 1919

**Auburndale, Mass.**

Enlisted in February, 1918, in the Air Service. He attended the School of Aeronautics, Princeton, N. J., and later was transferred to Carruthers Field, Fort Worth, Tex., where he was killed in an airplane accident October 14, 1918.

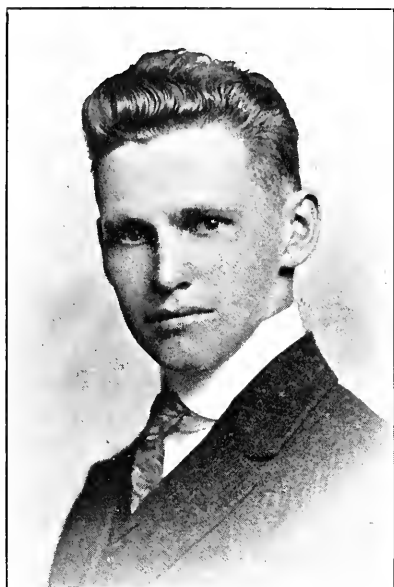
### BROOKS WOODWORTH, 1918

**Lowell, Mass.**

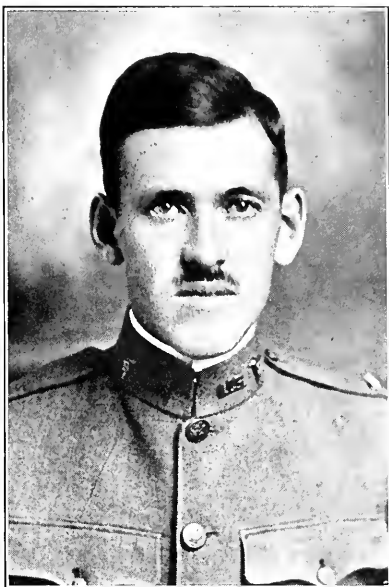
Enlisted May 14, 1917, and entered the First Plattsburg Training School. Later he was assigned to Company A, 303d Infantry, 76th Division, at Camp Devens, and then, as second lieutenant, to Company A, 10th Battalion Infantry, August 26, 1918. He died of pneumonia at Camp Lee, Virginia, October 21, 1918.







Windom Alpheus Allen



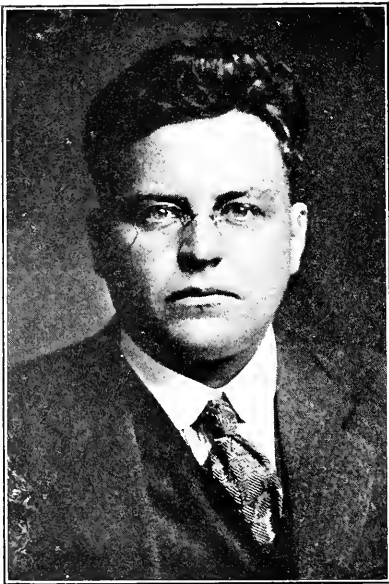
Dexter Edward Bailey



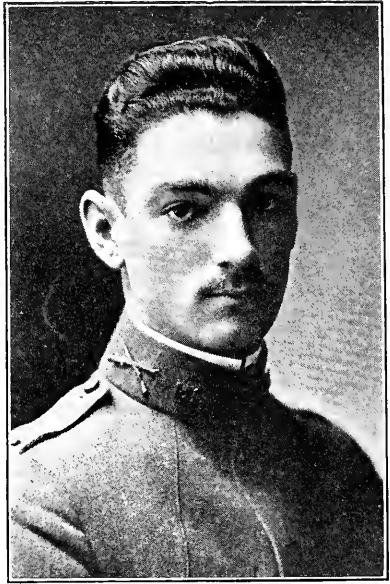
John Watling Bradley



Louis Carmel Brown



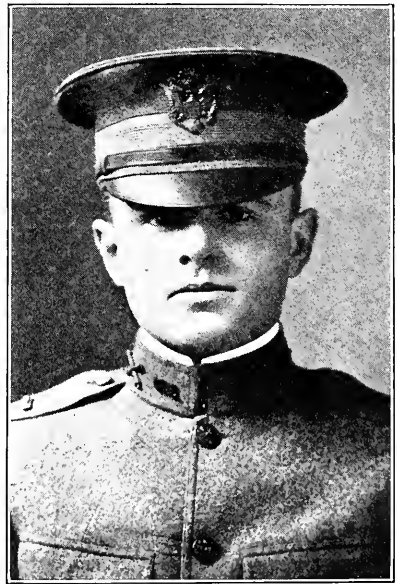
Elston Almond Day



Thomas Whitty Desmond



David Oliver Nourse Edes



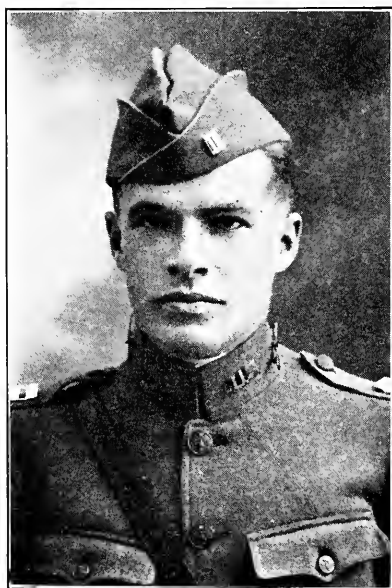
Alfred Austin Farwell



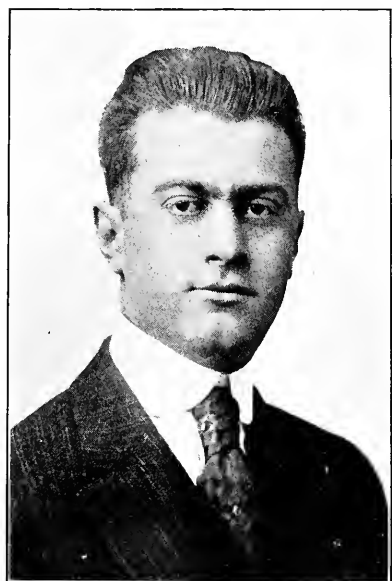
**Warren Francis Fisherdyck**



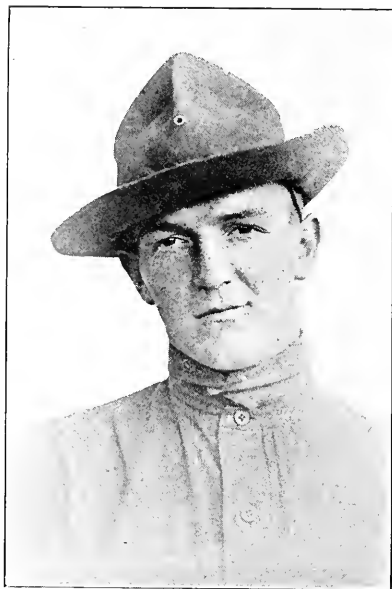
**William Patrick Fitzgerald**



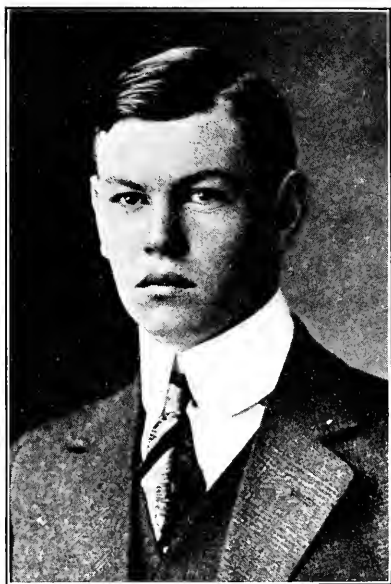
**Hamilton Knight Foster**



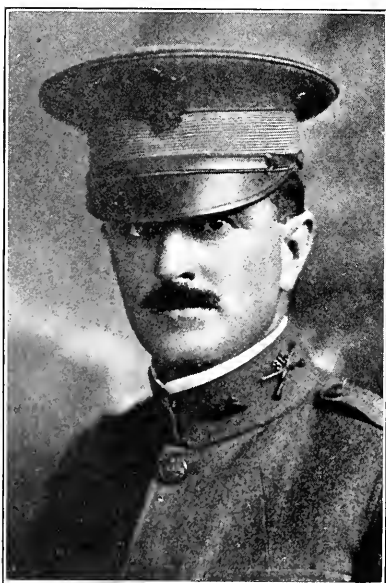
**Carroll Edward Fuller**



Laurence Washburn Gay



John Farrar Giles



Amos Francis Hamburger



Warren Timothy Harris



Willard Harrison Hasey



Warren Sidney Hathaway



Edward Asa Hooper



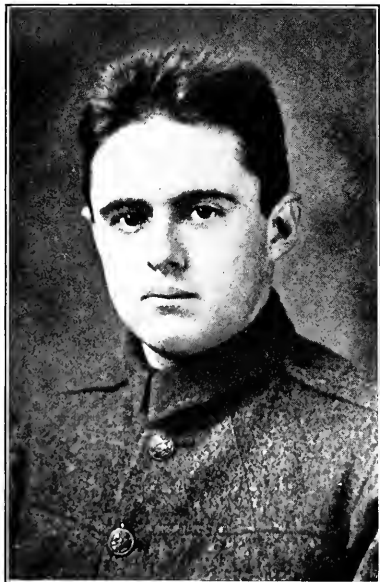
Robert Baker Hutchison



Harold Wilson Hyland



Robert Patterson Irvine



Forrest Dean Jones



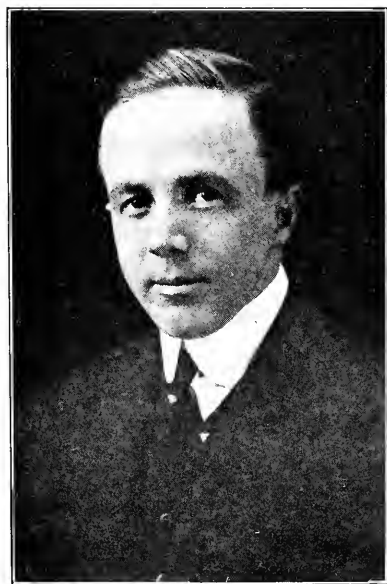
Trueman Eugene Kile



Samuel Koplovitz



Kenneth Bradford Laird

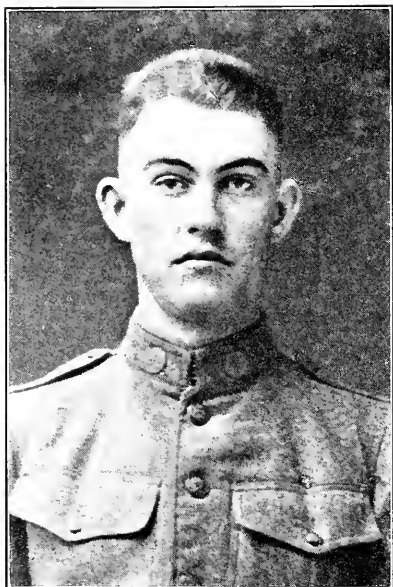


Edward Arthur Larrabee



Ralph Roby MacCormack





John Elmer Martin



John Raymond Moore



Ralph Thomas Neal

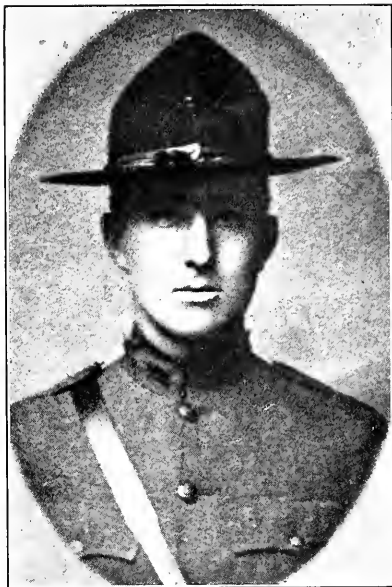


Arthur Victor Petit





**Ivan Andrew Roberts**



**Ernest Francis Sexton**



**Halliday Spencer Smith**



**Charles Marsh Streeter**



William Wallace Thayer



Robert Clayton Westman



Francis Wellington Whitney



Charles Raymond Wilber



**Alton Palmer Wood**



**Wilfred Livingstone Woodside**



**Brooks Woodworth**



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## M. A. C. SERVICE LIST

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## EXPLANATION OF SERVICE LIST

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The service list, which follows, includes:

1. Graduates, former students, and students through the class of 1924.

2. Unclassified and graduate students through 1918.

3. Members of the faculty who were in the employ of the institution between April 1, 1917, and November, 1918, and who during that period left their college work for war service. Members of the faculty who are also alumni of the College are listed in their respective classes.

Such members of the Student Army Training Corps are included who at any time previous or subsequent to their service in the S. A. T. C. registered as regular or unclassified students at the College.

In connection with the individual records, no mention is made of military or naval rank held, but those holding commissions of various rank are listed separately, beginning on page 157.

The first date indicated is the date of enlistment.

The following abbreviations are used in the list:

Aero Squadron, . . . . .	Aero Squad.
American Expeditionary Forces, . . . . .	A. E. F.
Artillery Brigade, . . . . .	Art. Brig.
Battalion, . . . . .	Bn.
Battery, . . . . .	Bat.
British Expeditionary Forces, . . . . .	B. E. F.
Canadian Expeditionary Forces, . . . . .	C. E. F.
Coast Artillery Corps, . . . . .	C. A. C.
Depot Detachment, . . . . .	Depot Det.
Engineers, . . . . .	Engrs.
Field Artillery, . . . . .	F. A.
Field Signal Battalion, . . . . .	Field Sig. Bn.
General Headquarters, . . . . .	Gen. Hdqrs.
Infantry, . . . . .	Inf.
Machine Gun Battalion, . . . . .	M. G. Bn.
Medical Corps, . . . . .	Med. Corps
Medical Department, . . . . .	Med. Dept.

## M. A. C. IN THE WAR

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Motor Transport Corps, . . . . .	M. T. C.
Officers' Training School, . . . . .	O. T. S.
Ordnance Department, . . . . .	Ord. Dept.
Quartermaster Corps, . . . . .	Q. M. C.
Sanitary Detachment, . . . . .	San. Det.
Section Sanitaire des Etats-Unis, . . . . .	S. S. U.
Signal Corps, . . . . .	Sig. Corps
Student Army Training Corps, . . . . .	S. A. T. C.
Student Naval Training Corps, . . . . .	S. N. T. C.
United States Naval Reserve Forces, . . . . .	U. S. N. R. F.
Veterinary Corps, . . . . .	Vet. Corps



# M. A. C. SERVICE LIST

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## CLASS OF 1878

HALL, JOSIAH N., Med. Dept., Chief of Medicine at Base Hospital, Camp Logan, Houston, Tex. Aug. 15, 1917, to April 20, 1919.

## CLASS OF 1882

KNOWLES, WILLIAM F., Med. Dept., Base Hospital, Camp Devens, Massachusetts. Sept. 7, 1917, to March 18, 1919.

WILLARD, DANIEL, Engrs., Trans. Dept. Nov. 2 to Dec. 2, 1918.

## CLASS OF 1885

BARBER, GEORGE H., Navy; Med. Corps. May 23, 1889, to date.

GOLDTHWAIT, JOEL E., May 5, 1917. A. E. F., May 19, 1917, to March 11, 1919. Med. Dept., 2d Orthopedic Unit. Citations: Distinguished Service Medal from British; Companion of Order of St. Michael and St. George. Discharged April 14, 1919.

## CLASS OF 1890

STILLINGS, LEE C.

## CLASS OF 1894

HIGGINS, CHAS. H., Canadian Army, Vet. Corps.

## CLASS OF 1895

DRURY, RALPH W., June, 1893, to 1895; Nov. 6, 1901. A. E. F., September, 1917, to Jan. 23, 1921. 9th, 13th, 16th, 47th Inf.; staff of 2d Div. Aisne defensive, Château-Thierry,

## M. A. C. IN THE WAR

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Aisne-Marne offensive, St. Mihiel, Meuse-Argonne offensive. Citations: Vaux, 1918; Château-Thierry, 1918. Still in service.

### CLASS OF 1897

EDDY, JOHN R., Aug. 25, 1917. A. E. F., May 22, 1918, to July 10, 1919. 39th Inf., 4th Div. Aisne-Marne offensive, Meuse-Argonne offensive. Discharged Aug. 16, 1919.

RANLETT, CHARLES A., May 12, 1917. A. E. F., June 25, 1918, to May 15, 1919. 303d Inf., 76th Div. St. Mihiel, Toul. Discharged June 4, 1919.

STEARNS, HAROLD E., Oct. 10, 1917. A. E. F., March 14, 1918, to June 18, 1919. Vet. Corps. Discharged July 10, 1919.

### CLASS OF 1899

KEENAN, GEORGE F., June 18, 1917. A. E. F., August, 1918, to July 1, 1919. 106th San. Train, 31st Div.; San. Train, 2d Army Corps; Director of Hospitals, American Embarkation Center. Discharged Aug. 1, 1919.

### CLASS OF 1900

MONAHAN, ARTHUR C., Jan. 3, 1918. San. Corps, Med. Dept.

### CLASS OF 1903

BROOKS, PHILIP W., F. A. Sept. 10 to Dec. 18, 1918.

TINKER, CLIFFORD A., Nov. 24, 1917. A. E. F., July 6, 1918, to March 8, 1919. Naval Aviation. Discharged Dec. 24, 1919. Recalled Sept. 20, 1920. Still in service.

### CLASS OF 1905

PAUL, AUGUSTUS R., Inf. March 27, 1917, to Dec. 20, 1919.

### CLASS OF 1906

FOSTER, SAMUEL C., Aug. 31, 1917. A. E. F., Feb. 24, 1918-. Co. D, 41st Engrs. Château-Thierry.

KENNEDY, FRANK H., Q. M. C. Aug. 5, 1918, to March, 1919.

## M. A. C. IN THE WAR

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RACICOT, ARTHUR J. Marine Corps, Dec. 3, 1904. Still in service.

STRAIN, BENJAMIN, Aug. 28, 1917. A. E. F., June 29, 1918, to Sept. 15, 1919. 55th Engrs. Discharged Oct. 4, 1919.

TANNATT, WILLARD C., Engrs. July 25, 1918, to Jan. 25, 1919.

### CLASS OF 1907

CARUTHERS, J. THOMAS, S. A. T. C. Instructor, Fiske University. Aug. 1 to Sept. 16, 1918.

CHASE, WAYLAND F.

CLARK, MILFORD H., Jr., Ord. Dept. Aug. 8, 1918, to Oct. 29, 1919.

CLEMENTSON, LEWIS T., Q. M. C. Dec. 29, 1917, to Sept. 24, 1919.

PETERS, FREDERICK C., Aug. 26, 1917. A. E. F., May 31, 1918, to April 21, 1919. 320th F. A., St. Mihiel; Meuse-Argonne. Discharged April 29, 1919.

SUMMERS, JOHN N., May 23, 1918. A. E. F., Oct. 20, 1918, to July 13, 1919. Tank Corps. Discharged Aug. 1, 1919.

### CLASS OF 1908

ALLEN, CHARLES F., Inf.; O. T. S. Sept. 10 to Dec. 8, 1918.

BARRY, THOMAS A., C. A. C.

HAMBURGER, AMOS F. Died of disease Oct. 6, 1918. (See page 56.)

HUTCHINGS, FRANK F., Co. B, 38th Engrs., A. E. F.

POTTER, J. SHERMAN, Chaplin's Training School, Nov. 16 to Dec. 2, 1918.

SAWYER, WILLIAM F., Oct. 7, 1917. A. E. F., Sept. 8, 1918, to July 13, 1919. 804th Inf. Discharged Aug. 4, 1919.

VERBECK, ROLAND H., Aug. 25, 1917. A. E. F., Aug. 13, 1918, to July 9, 1919. Inf.; 270th and 281st Aero Squad. Discharged Aug. 6, 1919.

WHITMARSH, RAYMOND D., Inf. Aug. 27, 1917.

## M. A. C. IN THE WAR

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### CLASS OF 1909

BEAN, THOMAS W., March 28, 1918. A. E. F., July 13, 1918, to June 13, 1919. Co. C, 301st Engrs., 76th Div. St. Mihiel, Meuse-Argonne, Toul, Army of Occupation. Discharged June 20, 1919.

BENT, GEORGE F., July 25, 1917. A. E. F., Sept. 25, 1917, to April 28, 1919. Co. E, 101st Engrs, 26th Div. Aisne-Marne, Rupt sector, St. Mihiel, Troyon, Meuse-Argonne, Chemin-des-Dames, Xivray defensive, Champagne-Marne. Discharged April 28, 1919.

NOBLE, HAROLD G., Air Service. Oct. 2, 1917, to March 12, 1919.

POTTER, RICHARD C., Inf. May 8 to Aug. 3, 1917.

SMITH, ALEXANDER H., April 25, 1918. C. E. F., June 3, 1918, to Sept. 15, 1919. 1st Canadian Tank Bn.; Can. Gen. Hdqrs., London. Discharged Oct. 16, 1919.

THAYER, ROBERT E., Q. M. C. Nov. 22, 1917, to Feb. 21, 1919.

THOMSON, JARED B., Inf. Jan. 5 to Dec. 23, 1918.

TUCKER, HORACE N., Inf.; O. T. S. Discharged Nov. 19, 1918.

### CLASS OF 1910

BAILEY, DEXTER E. Died of disease Dec. 2, 1918. (See page 49.)

BLANEY, JONATHAN P., Sig. Corps. Feb. 14 to Nov. 25, 1918.

BROWN, LOUIS C. Died from wounds Oct. 18, 1918. (See page 50.)

CALL, ALMON E., May 11, 1917. A. E. F., Aug. 15, 1918, to June 6, 1919. Co. F, 313th Engrs. Haute-Alsace. Discharged July 2, 1919.

DROHAN, JOSEPH C., June 27, 1917. A. E. F., Oct. 4, 1917, to March, 1919. 104th Inf., 26th Div. Apremont, Marne,

## M. A. C. IN THE WAR

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Château-Thierry, St. Mihiel. Wounded in arm July 25, 1918, by shrapnel. Discharged March 14, 1919.

FRENCH, HORACE W., May 8, 1917. A. E. F., July 6, 1918, to Feb. 12, 1919. 303d Inf., 76th Div., and 163d Inf., 41st Div. Discharged Feb. 19, 1919.

JOHNSON, WILLIAM C., San. Corps, Med. Dept. Dec. 13, 1917, to Dec. 23, 1918.

KELLEY, ALBERT C., U. S. N. R. F. Jan. 3 to Nov. 13, 1918.

LEONARD, LEAVITT E., Med. Dept. Nov. 27, 1916, to Oct. 4, 1917.

MOORE, HAROLD I., Cavalry; F. A. May 10, 1918, to Jan. 15, 1919.

STOCKWELL, CHELLIS W., Aug. 18, 1917. A. E. F., Jan. 13, 1918, to May 21, 1919. 639th Aero Squad. Toul. Discharged June 6, 1919.

TAYLOR, ISRAEL H., F. A. May 30, 1918, to Jan. 21, 1919.

### CLASS OF 1911

ADAMS, JAMES F., Inf. Medical School, Washington, D. C. June 29, 1918, to April 19, 1919.

ARMSTRONG, RALPH H., June 24, 1916. A. E. F., Oct. 4, 1917, to June 21, 1919. Co. D, 104th Inf., 26th Div.; Hdqrs. Dept., M. T. C., 26th Div. Apremont, Belleau Woods. Shell shocked. Discharged July 8, 1919.

BAKER, HERBERT J., Jan. 8, 1919. A. E. F., Jan. 8 to June 12, 1919. Y. M. C. A. and Army Educational Corps. Discharged June 27, 1919.

DAVIS, IRVING W., Marine Corps. July 14, 1918, to Jan. 10, 1919.

GILGORE, IRWIN C.

HENNESSEY, WILLIAM F., Inf.

HOWE, HAROLD H., Oct. 10, 1917. A. E. F., Oct. 31, 1917, to May 23, 1919. Co. B, 25th Engrs. Meuse-Argonne. Discharged June 3, 1919.

## M. A. C. IN THE WAR

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LARRABEE, EDWARD A. Died from wounds Dec. 7, 1918. (See page 59.)

NEILSON, GUSTAF A.

NICKERSON, GEORGE P., May 21, 1917. A. E. F., June 15, 1918, to Feb. 1, 1919. 343d F. A. Discharged Aug. 15, 1919.

PATCH, ROLAND H., Jan. 5, 1918. A. E. F., April 26, 1918, to May 6, 1919. Co. E, 302d Ammunition Train, 77th Div. Baccarat sector, Vesle, Oise-Aisne, Meuse-Argonne. Discharged May 20, 1919.

PAULY, HERMAN A., Dec. 15, 1917. A. E. F., Feb. 27, 1918, to Jan. 23, 1919. Inf., 1st Gas Regt. Feu-en-Tardenois, Vesle, 2d Battle of Marne, St. Mihiel, Moneilly, Meuse-Argonne, Verdun. Discharged Feb. 12, 1919.

PICKARD, PERCY W., F. A.; O. T. S. July 21 to Nov. 28, 1918.

PROUTY, PHILIP H., F. A.; O. T. S. June 15 to Dec. 3, 1918.

RACICOT, PHILEAS A., Chemical Warfare Service, Chief Gas Officer, Camp Hancock, Ga. June 1, 1918, to Feb. 27, 1919.

SMITH, RAYMOND G., 26th M. G. Bn. May 15, 1918-.

WOOD, ALTON P. Died from wounds May 4, 1918. (See page 63.)

YOUNG, DONNELL B., Med. Corps. Aug. 16, 1918, to Jan. 13, 1919.

### CLASS OF 1912

BAKER, HORACE M., Med. Dept. Jan. 23, 1918, to Jan. 2, 1919.

BEERS, ROWLAND T., May 15, 1917. A. E. F., July 4, 1918, to July 5, 1919. M. G. Co., 303d Inf., 76th Div.; 163d Inf., 41st Div.; Prisoner of War Escort Co. No. 225. Discharged July 26, 1919.

BENT, William R., May 8, 1917. A. E. F., May 8, 1918, to September, 1919. Co. A, 309th and 59th Inf. St. Mihiel, Meuse-Argonne. Army of Occupation. Wounded Oct. 17, 1918. Still in service.

## M. A. C. IN THE WAR

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- BODFISH, EDWARD H., Nov. 22, 1917. A. E. F., June 3, 1917, to June 26, 1919. 308th Engrs. Aisne-Marne, Oise-Aisne, Meuse-Argonne, Château-Thierry, Verdun. Army of Occupation. Discharged July 7, 1919.
- CURRAN, DANIEL J., F. A.; Air Service. Aug. 23, 1917, to Jan. 2, 1919.
- DODGE, ALBERT W., May 14, 1917. A. E. F., July 4, 1918, to April 13, 1919. 302d, 305th and 387th Inf. Meuse-Argonne. Discharged June 23, 1919.
- FISHERDICK, WARREN F. Died of disease Feb. 20, 1919. (See page 54.)
- GASKILL, LEWIS W., April 6, 1917. A. E. F., April 11 to Dec. 24, 1918. Co. A, 137th Inf.; Co. C., 110th Field Sig. Bn., 35th Div.; San. Unit No. 18. Verdun, Argonne, Alsace-Lorraine. Gassed and shell shocked. Discharged Jan. 21, 1919.
- GELINAS, LOUIS E., 30th F. A. Aug. 24, 1917, to April 8, 1919.
- GIBBS, ROBERT M., Inf. Aug. 28 to Dec. 23, 1918.
- HEATLEY, DAVID B., September, 1917. A. E. F., Jan. 15, 1918, to July 20, 1919. 23d Engrs.; Inf. Seicheprey, Xivray, St. Mihiel, Meuse-Argonne, Toul. Gassed July 12, 1918. Discharged Aug. 2, 1919.
- HILLS, FRANK B., Inf. Aug. 23, 1917, to March 22, 1919.
- HILTPOLD, WERNER, Med. Corps. June 28, 1917, to Aug. 27, 1919.
- HUBERT, BENJAMIN F., March 7, 1919. A. E. F., March 7 to June 6, 1919. Army Educational Corps. Discharged June 6, 1919.
- LAMSON, ROBERT W., Dec. 1, 1917. A. E. F., Sept. 8, 1918, to June, 1919. San. Corps, Med. Dept., Base Hospital No. 82. Discharged Sept. 10, 1919.
- LODGE, CHARLES A., Jr., Air Service. Aug. 23, 1917, to April 16, 1919.

## M. A. C. IN THE WAR

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MCGARR, THOMAS A., Med. Dept. May 17, 1918, to Aug. 14, 1919.

NORRIS, EDWARD J., Inf. May 25, 1918, to May 28, 1919.

OPPEL, EUGENE T., Navy Submarine Patrol. Oct. 8, 1915, to April 6, 1919.

PEARSON, CHARLES C., June 12, 1917. A. E. F., Oct. 30, 1917, to April 9, 1919. Co. C, 101st M. G. Bn., 26th Div. Chemin-des-Dames, Toul, Château-Thierry, St. Mihiel, Verdun. Discharged April 29, 1919.

PHILBRICK, WILLIAM E., F. A. Aug. 27, 1917, to Feb. 7, 1919.

PIERPONT, JOHN E., Dec. 14, 1917. A. E. F., July 5, 1918, to Jan. 5, 1919. Ord. Dept. Discharged Jan. 29, 1919.

PRATT, MARSHALL C., July 31, 1917. A. E. F., Oct. 9, 1917, to June 27, 1919. 284th Mil. Police Co., Inf. Château-Thierry, St. Mihiel, Meuse-Argonne. Discharged July 2, 1919.

RAYMOND, ARTHUR N., Inf. June 23 to Dec. 11, 1918.

SANCTUARY, WILLIAM C., Dec. 8, 1917. A. E. F., Sept. 23, 1918, to March 7, 1919. Sig. Corps. Discharged March 17, 1919.

SELLEW, LEWIS R., Dec. 1, 1917. A. E. F., March 30, 1918, to June 9, 1919. 23d Engrs. Meuse-Argonne. Discharged June 17, 1919.

SHAW, EZRA I., Marine Corps. Dec. 22, 1917, to March 6, 1919.

SPRINGER, ISAAC, Air Service. Aug. 18, 1917, to Nov. 25, 1918.

STACK, HERBERT J., Aug. 29, 1917. A. E. F., June, 1918, to March 6, 1919. 11th Aero Squad, 1st Army, 29th Div. Argonne, Château-Thierry. Wounds: injured in crash Oct. 16, 1918, and injured November, 1918. Citation received from chief of Air Service for work on parachute experiments. Discharged March 6, 1919.

TUPPER, GEORGE W., Inf. Aug. 27, 1917, to Dec. 19, 1918.



## M. A. C. IN THE WAR

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- TURNER, HOWARD A., Med. Corps. Nov. 9 to Nov. 12, 1918.  
WALES, ROBERT W., Dec. 10, 1917. A. E. F., June 30, 1918-  
376th Aero Squad.  
WILDE, EARLE I., Q. M. C. Oct. 22 to Dec. 6, 1918.  
WILLIAMS, SILAS, Ord. Dept.

### CLASS OF 1913

- ALLEN, HARRY W., Med. Corps. April 9, 1918, to June 18,  
1919.  
ANGIER, HARRIS W., Engrs. Oct. 10, 1917, to April 11, 1919.  
BARBER, GEORGE W., 11th Cavalry. Oct. 28, 1917, to May 15,  
1919.  
BROWN, HERBERT A., Aug. 27, 1917. A. E. F., June 4, 1918,  
to May 26, 1919. 353d Inf., 89th Div. Toul, St. Mihiel,  
Verdun, Argonne, Meuse. Army of Occupation. Dis-  
charged June 19, 1919.  
BULLARD, ALVAN H., Inf. May 15 to Nov. 23, 1918.  
CLARK, NORMAN R., Inf. Aug. 26, 1917, to Feb. 1, 1919.  
CORY, HAROLD R., Engrs. July 8, 1917, to Feb. 4, 1918.  
DANIEL, EDWARD S., May 4, 1917. A. E. F., Sept. 25, 1917,  
to Dec. 11, 1918. Co. F, 101st Engrs., 26th Div. Toul,  
Chemin-des-Dames, Château-Thierry, St. Mihiel. Dis-  
charged Feb. 20, 1919.  
DAYTON, JAMES W., Aug. 5, 1917. A. E. F., Sept. 25, 1918, to  
Feb. 19, 1919. Air Service. Discharged Feb. 24, 1919.  
DOHANIAN, SENEKERIM M., Med. Dept. Air Service, Oct. 11,  
1917, to Jan. 21, 1919.  
EDMINSTER, ALBERT F., Inf.; O. T. S. July 29 to Nov. 23,  
1918.  
ELLS, GORDON W., Feb. 1, 1915. Co. F and Co. I, 27th Inf.;  
Co. G and M. G. Co., 15th Inf. Panama, Oct. 6, 1915, to  
Jan. 24, 1916; Philippines, March 6, 1916, to July 24, 1917;  
China, July 30 to Aug. 1, 1919. Still in service.

## M. A. C. IN THE WAR

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- FORBUSH, WALLACE C., Inf. Feb. 1, 1918, to Jan. 10, 1919.
- FRENCH, JAMES D., Aug. 27, 1917. A. E. F., July 14, 1918, to March 14, 1919. 304th Trench Mortar Bn., Inf. Discharged April 2, 1919.
- GOODNOUGH, HENRY E., May 6, 1917. A. E. F., Sept. 21, 1917, to March 29, 1919. 101st Inf., 26th Div. Chemin-des-Dames, Toul, Château-Thierry, St. Mihiel, Tyron sector, Neptune, Verdun, Belleau Woods, Côte Poivie sector, Beaumont. Wounded by concussion of shell Nov. 9, 1918. Recommended for Distinguished Service Cross Nov. 2, 1918. Discharged May 21, 1919.
- GORE, HAROLD M., Aug. 23, 1917. A. E. F., Jan. 15, 1918, to Jan. 9, 1919. 18th Inf., 1st Div. Gassed May 3, 1918. Discharged Jan. 28, 1919.
- GREENLEAF, GEORGE F., Inf. Aug. 4, 1918, to Jan 6, 1919.
- GUILD, LOUIS F., March, 1915. A. E. F., March, 1918, to June 13, 1919. Mil. Police Co., Inf. Discharged July 9, 1919.
- HASEY, WILLARD H. Killed in action July 19, 1918. (See page 56.)
- HEADLE, HERBERT W., Nov. 23, 1917. A. E. F., March 29, 1918, to July 27, 1919. Co. E, 23d Engrs. Meuse-Argonne. Discharged Aug. 1, 1919.
- HEADLE, MARSHALL, June 7, 1917. A. E. F., Aug. 20, 1917-. Air Service.
- HUBBARD, ROSWELL E., May 6, 1918. U. S. N. R. F. Transport Service, Dec. 28, 1918, to May 15, 1919. Discharged May 15, 1919.
- HUNTINGTON, SAMUEL P., Dec. 14, 1917. U. S. N. R. F. Convoy duty, Cruiser and Transport Service, March 19, 1918, to Oct. 20, 1918; Dec. 22, 1918, to July 6, 1919. Discharged Aug. 14, 1919.
- HUTCHISON, ROBERT B. Killed in action Sept. 7, 1918. (See page 57.)
- HYLAND, HAROLD W. Died from wounds Sept. 1, 1918. (See page 57.)

## M. A. C. IN THE WAR

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- JONES, HAROLD F., F. A. Aug. 5, 1918, to Jan. 18, 1919.
- JORDAN, S. MILLER, Inf. May 15, 1918, to May 18, 1919.
- KELLEY, ALBERT J., May 10, 1917. A. E. F., July 4, 1918, to Feb. 18, 1919. 301st Inf., 76th Div.; 163d Inf., 41st Div. Discharged Feb. 21, 1919.
- KELLEY, BERNARD J., Inf. Sept. 4 to Nov. 18, 1918.
- LARSEN, NILS P., April 2, 1917. A. E. F., May 10, 1918, to March 6, 1919. Med. Corps, 106th Inf., 27th Div. Hindenburg Line, La Selle River, Albert, Vierstreet Ridge, Mt. Kennell, Belgium, Knoll-Guilkmont Farm, St. Maurice River, vicinity of Catillion. Divisional citation, Dec. 3, 1918. Discharged July 22, 1919.
- LESURE, JOHN W. T., Inf. Jan. 4 to Dec. 3, 1918.
- LYON, HAROLD, Sig. Corps; Med. Dept. April 4, 1918, to May 12, 1919.
- MAYER, JOHN L., Aviation. U. S. N. R. F. Dec. 6, 1917, to December, 1918.
- MILLER, HAROLD H., Nov. 21, 1917. A. E. F., March 14 to Dec. 31, 1918. C. A. C. Discharged Jan. 28, 1919.
- NEAL, RALPH T. Killed in action Oct. 2, 1918. (See page 60.)
- NICHOLS, NORMAN J., Inf. Sept. 21, 1917, to April 21, 1919.
- PARSONS, ROBERT, Engrs., Chemical Warfare Service. May 29 to Dec. 17, 1918.
- PATCH, ROY K., Aug. 13, 1917. A. E. F., June 4, 1918, to July 21, 1919. Field Hospital No. 30, 5th San. Train, Med. Dept., 5th Div. St. Mihiel. Discharged July 29, 1919.
- PROUTY, ROY H., Sept. 20, 1917. A. E. F., July 12, 1918, to April 10, 1919. Co. B, 316th Ammunition Train, 91st Div. Discharged May 13, 1919.
- ROEHRS, HERMAN T., Ord. Dept. June 25, 1917, to Dec. 23, 1918.
- ROSE, STEPHEN D., April 7, 1917. U. S. N. R. F. French Coast Patrol, May and June, 1918. Discharged Dec. 15, 1918.

## M. A. C. IN THE WAR

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RYDER, HAROLD W., Oct. 7, 1917. A. E. F., May 19, 1918, to May 6, 1919. Co. F, 307th Ammunition Train, 87th Div. Argonne, St. Mihiel, Sedan. Discharged May 22, 1919.

STREETER, CHARLES M. Died from wounds Oct. 16, 1918. (See page 61.)

THAYER, CLARK L., Ammunition Train, Inf. Sept. 5 to Dec. 17, 1918.

WHEELER, HENRY L., Inf. Feb. 25 to Dec. 4, 1918.

WHITNEY, FRANCIS W. Died from wounds Oct. 18, 1918. (See page 62.)

### CLASS OF 1914

ALBEE, GERARD O., May 28, 1917. A. E. F., October, 1917, to April, 1919. Bat. B, 103d F. A. Meuse-Argonne, Seicheprey, Xivray, Toul, Château-Thierry, St. Mihiel. Discharged April 29, 1919.

ALLEN, CARL M., July 6, 1917. A. E. F., Sept. 8, 1917, to January, 1919. Med. Dept.; Chemical Warfare Service. Discharged Feb. 7, 1919.

ANDERSON, LESLIE O., June 29, 1917. A. E. F., May 19, 1918, to April 13, 1919. 3d Co., 151st Depot, Med. Corps. Base Hospital No. 117. Discharged May 2, 1919.

BAKER, MELVILLE, Nov. 17, 1917. A. E. F., Aug. 1, 1917, to Sept. 24, 1919. Royal Flying Corps. Discharged Oct. 12, 1919.

BESSER, SIDNEY S., July 22, 1917. A. E. F., Oct. 19, 1917-. Bat. B, 103d F. A., 26th Div. Toul, Soissons, St. Mihiel, Verdun.

BICKFORD, HORACE M., Jr., Air Service. Dec. 26, 1917, to Dec. 16, 1918.

BLACK, HAROLD C., Ord. Dept. May 10 to Dec. 31, 1918.

BOKELUND, CHESTER H., Marine Corps. April 28, 1918, to Jan. 23, 1919.

BRADLEY, JOHN W. Killed July 4, 1918. (See page 49.)

## M. A. C. IN THE WAR

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- BRAGG, RALPH S., Oct. 14, 1917. A. E. F., Jan. 1, 1918, to Aug. 4, 1919. Hdqrs. 1st Bn., 23d Engrs. St. Mihiel, Aisne-Marne, Meuse-Argonne. Discharged Aug. 4, 1919.
- BREWER, HAROLD W., U. S. N. R. F. May 20 to Dec. 16, 1918.
- BROWN, HARRY D., Aug. 23, 1917. A. E. F., Jan. 15, 1918, to July 5, 1919. 18th Inf., 1st Div. Cantigny, Soissons, Marne, St. Mihiel, Meuse-Argonne. Wounds: right arm at Soissons, July 18, 1918; right leg at Meuse-Argonne, Oct. 4, 1918. Discharged July 9, 1919.
- CHAPON, ROBERT H. Killed in action Dec. 30, 1914. (See page 51.)
- CHRISTIE, EDWARD W., May 19, 1917. A. E. F., June 1918-. 329th Inf., 83d Div.
- CLARK, ERNEST S., Jr., Inf. Oct. 5, 1917, to Dec. 7, 1918.
- CLAY, HAROLD J., Q. M. C. Oct. 1 to Dec. 3, 1918.
- COLEMAN, DAVID A., June 1, 1918. A. E. F., Sept. 13, 1918, to May 19, 1919. Med. Corps. Discharged June 12, 1919.
- DAMON, SAMUEL R., Dec. 1, 1914. A. E. F., Oct. 24, 1917, to April, 1919. Bat. A, 103d F. A., 26th Div. Discharged April 29, 1919.
- DAVIS, RALPH E., Air Service. Dec. 11, 1917, to Nov. 27, 1918.
- DEMOND, ROBERT N., Oct. 1, 1917. A. E. F., March 12, 1918, to May 27, 1919. Hdqrs. Troop, 6th Army Corps, Inf. Discharged June 4, 1919.
- EARLE, HENRY W., Inf. July, 1917, to Oct. 28, 1919.
- EDGERTON, ALMON M., F. A. Aug. 1, 1917, to Jan. 6, 1919.
- EDMONDS, SIDNEY W., Oct. 18, 1917. A. E. F., Oct. 18, 1917, to June 28, 1919. M. T. C. Cited for especially meritorious service April 19, 1919, by General Pershing. Discharged July 30, 1919.

## M. A. C. IN THE WAR

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EDWARDS, EDWARD C. In charge of German prison camp; Camp Salvage Officer, Camp Devens; Q. M. C. May 12, 1917, to November, 1919.

ELDRIDGE, HAROLD L., May 28, 1917. U. S. N. R. F. Group commander of 3 sub-chasers, operated in North Atlantic and six months in war zone. Discharged June 3, 1919.

FOSTER, STUART B., March 25, 1917. A. E. F., Jan. 1, 1918, to July, 1919. San. Corps, 104th Inf., 26th Div. Chemin-des-Dames, Toul, Château-Thierry, Haute Alsace, Meuse-Argonne. Discharged July 29, 1919.

FREEBORN, STANLEY B., Med. Dept. Aug. 8, 1918, to May 3, 1919.

FULLER, GEORGE, U. S. N. R. F. March 5 to Dec. 22, 1918.

GIBSON, DAVID W., Inf. Discharged Dec. 19, 1918.

GREBIN, MARK A., Inf., 12th Div. July 20, 1918, to Jan. 28, 1919.

GRIFFIN, WILLIAM G., Dental Section, Med. Dept.

HADFIELD, HAROLD F., Naval Aviation. April 30, 1918, to Jan. 15, 1919.

HANDY, RALPH E., Nov. 13, 1917. A. E. F., July 16, 1918, to June 9, 1919. Co. C, 301st Supply Train, Inf., 76th Div. Discharged June 14, 1919.

HARRIMAN, VINCENT S., Inf. July 31 to Nov. 23, 1918.

HASKELL, WILLARD A., U. S. N. R. F. March 16, 1918, to Feb. 26, 1919.

HEBARD, EMORY B., Inf. June 25, 1918, to June 3, 1919.

HEFFRON, FRED, Oct. 4, 1918. A. E. F., July 4, 1918, to Aug. 31, 1919. Co. I, 302d Inf., 76th Div.; Co. B, 163d Inf. Discharged Sept. 9, 1919.

HUTCHINSON, JOHN G., Naval Aviation. Dec. 13, 1917, to Nov. 27, 1918.

JACOBS, LORING H., Naval Aviation. April 4, 1918, to Jan. 7, 1919.

## M. A. C. IN THE WAR

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- JEWETT, HENRY D. American Ambulance Field Service, French Army, July, 1916, to June, 1917; F. A., June to December, 1917; Canadian Engrs., April, 1918; C. E. F., April, 1918, to February, 1919. Verdun, Argonne, Arras. Discharged February, 1919.
- JOHNSON, ROLLIN E., Inf. May 2, 1917, to June 14, 1919.
- KILBOURN, WALTON G., Q. M. C. Nov. 9, 1918, to March 18, 1919.
- LEMOINE, ALBERT Z., May 8, 1917. A. E. F., Sept. 24, 1917, to May, 1919. Bat. A, 101st F. A., 26th Div. Chemin-des-Dames, Marne, St. Mihiel, Meuse-Argonne, Champagne-Marne, Toul. Discharged May 20, 1919.
- LEVINE, HENRY W., U. S. N. R. F. May 31, 1918, to Jan. 11, 1919.
- LUCAS, HOYT D., Chemical Warfare Service. Oct. 23, 1917, to March 3, 1919.
- LUNDGREN, R. ARTHUR, Inf.; O. T. S. Oct. 28 to Dec. 5, 1918.
- MAJOR, JOSEPH, Air Service.
- M McNIFF, OWEN A., Air Service. Sept. 25, 1917, to Feb. 6, 1919.
- MELOON, RALPH R., Inf.
- MORSE, HAROLD J., U. S. N. R. F. Oct. 11, 1917, to Aug. 16, 1919.
- MUNROE, DONALD M., Inf. Aug. 13, 1918, to Jan. 15, 1919.
- NICOLET, TELL W., Q. M. C. May 8, 1918, to Aug. 20, 1920.
- NICOLET, THEODORE A., Q. M. C. May 14, 1917, to March 24, 1919.
- OERTEL, JOHN T., F. A. June 26 to Nov. 29, 1918.
- PALMER, JOHN P., Ord. Dept.; F. A. July 31, 1917, to Dec. 14, 1918.
- PETERSEN, PEVERILL O., Dec. 13, 1917. A. E. F., Aug. 7, 1918, to July 7, 1919. Q. M. C., Wagon Co. No. 304. Discharged July 15, 1919.

## M. A. C. IN THE WAR

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PIGOTT, EDGAR R., Inf. July 6 to 14, 1918.

POWERS, RICHARD H., C. A. C. July 1, 1917, to Dec. 11, 1918.

PRESLEY, FRED Y., May 30, 1917. A. E. F. Med. Corps.

PRIEST, ROGER A., Nov. 6, 1917. A. E. F., July 8, 1918, to April 12, 1919. 317 Field Sig. Bn., Sig. Corps. St. Mihiel, Meuse-Argonne. Gassed Oct. 19, 1918. Discharged May 9, 1919.

ROSEBROOKS, WALTER E., Jan. 5, 1918. A. E. F., April 16, 1918, to April 2, 1919. Co. G, 306th Inf., 77th Div. Meuse-Argonne, Lorraine defensive. Discharged April 25, 1919.

SIMMONS, GEORGE W.

SMALL, FRANCIS W., Inf. Oct. 4, 1917, to March 1, 1919.

STEVENS, ARTHUR E., Sept. 1, 1917. A. E. F., Jan. 13, 1918, to July 2, 1919. 13th, 30th, 641st, 642d, and 1104th Aero Squad. Discharged July 24, 1919.

TAFT, CARL M., Inf. Sept. 19 to Dec. 9, 1918.

TARBELL, MUNROE G., Inf. July 14 to Dec. 10, 1918.

TOWER, ALFRED L., Aug. 24, 1917. A. E. F., Dec. 27, 1917, to March 17, 1919. C. A. C. Alsace Front, Verdun. Awarded Croix de Guerre with bronze star by French government. Discharged April 29, 1919.

TUPPER, ARTHUR S., May 1, 1917. A. E. F., July 9, 1917, to April 27, 1919. Co. E, 15th Engrs. Discharged May 15, 1919.

UPTON, ERNEST F., Inf. Sept. 5 to Dec. 20, 1918.

WALKER, NATHANIEL K., May 25, 1918. A. E. F., July 8, 1918, to March 25, 1919. Med. Corps, Base Hospital No. 7. Discharged April 4, 1919.

WARD, TALBOT, July 25, 1917. A. E. F., Sept. 25, 1917, to March 27, 1919. 101st Engrs., 26th Div. Soissons, Toul, Château-Thierry, St. Mihiel, Verdun. Discharged April 28, 1919.



## M. A. C. IN THE WAR

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WEIGEL, ARTHUR G., Chemical Warfare Service. Sept. 20 to Dec. 20, 1918.

WHEELER, CHESTER E., Air Service. Aug. 26, 1917, to Jan. 18, 1919.

WHIDDEN, BURTON C., Inf. Sept. 7, 1918, to Jan. 15, 1919.

WHIPPEN, CHARLES W., Bat. C, 302d F. A., 76th Div. A. E. F., Sept. 17, 1917, to Dec. 13, 1919.

WOOD, HENRY J., Jan. 1, 1918. A. E. F., March 24, 1918, to April 14, 1919. Co. A, 9th Inf., 2d Div. Soissons, St. Mihiel, Mont Blanc, Argonne, Arras. Wounded May 12 and Nov. 5, 1918. Awarded Distinguished Service Cross Nov. 5, 1918. Discharged Oct. 1, 1919.

### CLASS OF 1915

ALDEN, CHARLES H., Inf. June 26, 1918, to Jan. 14, 1919.

ALLEN, F. ELLWOOD, San. Corps, Med. Dept. April 6, 1918, to Sept. 20, 1919.

BANISTER, SETH W., Oct. 5, 1917. A. E. F., March 4, 1918, to March 31, 1919. 166th Aero Squad. Verdun, Argonne. Discharged Oct. 18, 1919.

BARTLETT, EDWARD R., Inf. Sept. 19, 1917, to Jan. 31, 1919.

BARTLEY, HASTINGS N., U. S. N. R. F. June 25, 1917, to May 28, 1919.

BEERS, NORMAN L., Q. M. C.

BEMIS, WILLARD G., Dec. 10, 1917. A. E. F., Aug. 1, 1918, to July 13, 1919. 331st and 625th Aero Squad. Discharged July 31, 1919.

BISHOP, CHESTER A., Inf. Jan. 5, 1918, to Jan. 11, 1919.

BRALEY, MERTON L., Inf. May 22, 1917, to Feb. 19, 1919.

BREDEMEIER, CARL L., U. S. N. R. F. July 6, 1917, to May 22, 1919.

BROOKS, GARDNER M., Inf. May 19, 1918, to Jan. 24, 1919.

## M. A. C. IN THE WAR

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- BUTTRICK, JOHN W., Dec. 6, 1917. U. S. N. R. F. Transport Service, October, 1918, to October, 1919. Discharged Oct. 19, 1919.
- CALLARD, JOHN C., June 29, 1917. A. E. F., July 6, 1918, to April 20, 1919. Med. Corps, U. S. Base Hospital No. 44. Discharged May 2, 1919.
- CANDE, DONALD H., Sept. 8, 1917. A. E. F., Sept. 22, 1917, to March 30, 1919. Vet. Corps; Bat. D, 102d F. A., 26th Div. Seicheprey, Marne, St. Mihiel, Verdun. Discharged April 29, 1919.
- CHASE, ALEXANDER B., Jr., Sept. 21, 1917. A. E. F., July 15, 1918, to May 24, 1919. Co. A, 301st Supply Train, 76th Div. Discharged June 11, 1919.
- CHURCHILL, CHESTER A., Aug. 1917. A. E. F., January, 1918-. 43d Co., 5th Regt., Marine Corps. Château-Thierry, Soissons, Blanc Mont Ridge, Meuse-Argonne, Bayonneville, Beaumont. Army of Occupation.
- CLARK, ARTHUR L., May 12, 1917. A. E. F., Jan. 9, 1918, to Jan. 15, 1919. 24th Aero Squad. St. Mihiel. Taken prisoner in Germany Sept. 17, 1918. Discharged Jan 31, 1919.
- CLARK, GEORGE H., May 4, 1917. A. E. F., Sept. 26, 1917, to Nov. 29, 1918. 101st Engrs. Chateau-Thierry, St. Mihiel, Meuse-Argonne. Discharged April, 1919.
- CLEVELAND, WALDO A., Air Service. Nov. 16, 1917, to Feb. 3, 1919.
- COHEN, SAMUEL A., June 8, 1917. A. E. F., July, 1918, to Feb. 22, 1919. 71st C. A. C.; Med. Corps, Base Hospital No. 27. Discharged March 8, 1919.
- DALRYMPLE, ANDREW C., F. A. May to Dec. 13, 1918.
- DAMON, LEON B., Inf. Aug. 29 to Dec. 6, 1918.
- DONNELL, GEORGE E., Ord. Dept.; F. A. Feb. 21 to Dec. 6, 1918.
- FITZGERALD, DANIEL J., Air Service. Dec. 1, 1917, to Nov. 26, 1918.

## M. A. C. IN THE WAR

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- FLEBUT, ALPHA J., Inf. Jan. 10, 1916, to Oct. 2, 1919.
- FULLER, RICHARD, O. T. S., Instructor. May 15, 1918, to Dec. 21, 1920.
- GARE, EDWARD J., Jr., Air Service. Jan. 18, 1918, to Jan. 4, 1919.
- GRANT, HAROLD D., April 28, 1918. A. E. F., July 14, 1918, to May, 1919. Co. A, 301st Engrs., 76th Div. St. Mihiel, Toul, Argonne. Army of Occupation. Discharged May 22, 1919.
- GRIGGS, RAYMOND B., May 12, 1917. A. E. F., Sept. 7, 1917, to July 1, 1919. Hdqrs. Co., 102d Inf., 26th Div. Chemin-des-Dames, Toul, Château-Thierry, St. Mihiel, Verdun. Gassed Oct. 10, 1918. Discharged July 25, 1919.
- HALL, GEORGE M., May 5, 1917. B. E. F., May 14, 1917, to April, 1918. A. E. F., April, 1918, to March 26, 1919. Med. Dept. Ypres, Arras. Discharged April 4, 1919.
- HALL, RODERICK C., Med. Dept. June 9, 1917, to June 2, 1919.
- HARPER, JAMES E., O. T. S. Aug. 19, 1918, to Jan. 1, 1919.
- HASKELL, WILLIS H., Jr., Dec. 5, 1917. A. E. F., April 16, 1918, to April 24, 1919. Co. G, 305th Inf., 77th Div. Vesle-Aisne, Meuse-Argonne. Discharged May 9, 1919.
- HATFIELD, WILLIAM H., Sept. 19, 1917. A. E. F., May 4, 1918, to May, 1919. Inf.; 302d Ammunition Train, 152d F. A., 77th Div. Lorraine Front, Vesle, Meuse-Argonne. Discharged May 16, 1919.
- HATHAWAY, ISAAC, July 14, 1917. U. S. N. R. F. Transport Service, June 3, 1918, to Feb. 28, 1919. U. S. S. "George Washington," June 3 to Sept. 26, 1918; U. S. S. "Peerless," Dec. 8, 1918, to Feb. 28, 1919. Discharged March 18, 1919.
- HAWES, CLAYTON P., May 1, 1917. A. E. F., June, 1918, to February, 1919. 351st F. A. Marbache sector. Discharged Feb. 28, 1919.
- HEARTZ, FORREST O., C. A. C. Sept. 29 to Dec. 17, 1918.

## M. A. C. IN THE WAR

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- HOUGHTON, ARTHUR R., U. S. N. R. F. July 10, 1917, to April, 1919.
- HYDE, G. FRED, Inf. Aug. 15, 1917, to Dec. 23, 1918.
- HYDE, HAROLD G., Engrs.; O. T. S. Sept. 17 to Nov. 27, 1918.
- JACKSON, JOHN C., C. A. C. April 26 to Dec. 23, 1918.
- JOUBERT, SYLVESTER G., Nov. 10, 1914. C. E. F. March 6, 1915, to July 15, 1919. 8th and 32d Bat., Wireless School, Canadian Army. Ypres, Ploegstreet, Messines. Wounded by shell fire May 20, 1915. Discharged July 29, 1919.
- KELLEHER, JEROME J., Dec. 13, 1917. A. E. F., April 16, 1918, to June 9, 1919. Co. M, 23d Engrs. Discharged June 17, 1919.
- KOMP, WILLIAM H. W., U. S. Public Health Service. Jan. 21, 1918. Still in service.
- KOPLOVITZ, SAMUEL. Died from wounds Oct. 24, 1918. (See page 58.)
- LEWIS, J. KIRBY, Nov. 30, 1917. A. E. F., Jan. 3, 1918, to June 1, 1919. M. T. C. Discharged June 18, 1919.
- LINCOLN, IRVING B., Ord. Dept. Sept. 1, 1918, to Feb. 5, 1919.
- LOVEJOY, JOHN S., Q. M. C.
- MACDONALD, NORMAN D., Aug. 6, 1918. A. E. F., Oct. 12, 1918-. 346 Labor Bn., Hdqrs. Co., Q. M. C.
- MACNEIL, RALPH L., Air Service. Dec. 15, 1917, to Jan. 2, 1919.
- McKECHNIE, RAY F., Dec. 10, 1917. U. S. N. R. F. Transport Service, June 23 to Aug. 22, 1918; Sept. 10 to Dec. 22, 1918. Discharged April 21, 1919.
- McLAIN, RALPH E., Nov. 30, 1916. A. E. F., June 8, 1917, to July 18, 1919. 26th and 34th Inf.; 1st Train Hdqrs. and Mil. Police; 1st Ammunition Train, 36th Inf. Montdidier-Noyon, Aisne-Marne, St. Mihiel, Meuse-Argonne. Still in service.

## M. A. C. IN THE WAR

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- MELICAN, GEORGE D., December, 1917. A. E. F., July, 1918, to Aug. 1, 1919. 166th Aero Squad. Discharged Aug. 2, 1919.
- MOBERG, CARL D., C. A. C. Aug. 1 to Dec. 23, 1918.
- MOBERG, ELDON S., F. A. May 15 to Nov. 29, 1918.
- MONTAGUE, ENOS J., Inf.; Air Service. Aug. 27, 1917, to Dec. 7, 1918.
- MOORE, ROGER H., Aug. 11, 1917. A. E. F., June 1, 1918-. Med. Dept. Army of Occupation.
- PARKER, EDWIN K., Sept. 23, 1917. A. E. F., Sept. 26, 1917, to July 20, 1919. 101st Engrs., 26th Div. Chemin-des-Dames, Champagne, St. Mihiel, Aisne-Marne, Meuse-Argonne, Rupt sector, Troyon sector. Wounded and gassed. Discharged July 26, 1919.
- PATTEN, MERRIL C., Air Service. April 23 to Dec. 13, 1918.
- PATTERSON, ROBERT E., May 8, 1917. A. E. F., September, 1918, to March, 1919. 20th Aero Squad. American Commission to Negotiate Peace. Discharged April 1, 1919.
- PENDLETON, HARLOW L., Dec. 18, 1917. A. E. F., July 31, 1918, to Feb. 22, 1919. Bat. A, 71st C. A. C. Discharged March 6, 1919.
- PIKE, JOSEPH S., Jr., Nov. 25, 1917. A. E. F., March 28, 1918, to May 28, 1919. 23d Engrs. St. Mihiel, Metz. Discharged June 17, 1919.
- RENDALL, RAYMOND E., Nov. 1, 1917. A. E. F., February, 1918, to Jan. 27, 1919. 13th Co., 20th Engrs.; Co. I, 23d Inf., 2d Div. St. Mihiel, Argonne. Discharged Feb. 19, 1919.
- RHOADES, PAUL W., M. T. C. Sept 27, 1917, to April 12, 1919.
- SABEN, MAXWELL B., June 13, 1917. U. S. N. R. F. Sea Service, Nov. 23, 1917, to Jan. 7, 1920. Discharged February, 1920.
- SCOTT, LINCOLN B., Inf.

## M. A. C. IN THE WAR

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- SEARS, WILLIAM R., May 15, 1917. A. E. F., April 16, 1918, to Jan. 18, 1919. 111th and 305th Inf. Vesle. Wounded near Fismes Sept. 8, 1918. Discharged Sept. 26, 1919.
- SEVERANCE, VERNE L., Q. M. C. July 31, 1917, to May 15, 1919.
- SHAYLOR, FRED W., Chemical Warfare Service. March 26, 1918, to Feb. 3, 1919.
- SIMON, ISAAC B., Nov. 5, 1916. A. E. F., Aug. 12, 1918, to January, 1919. 38th and 324th Inf. Meuse-Argonne. Discharged March 1, 1919.
- SLEIN, OWEN F., Dec. 11, 1917. U. S. N. R. F. Transporting troops, Dec. 6, 1918, to April 28, 1919. Discharged May 16, 1919.
- SMITH, FRANCIS A., Inf. Aug. 27, 1917, to Feb. 17, 1919.
- SMITH, HYDE, Q. M. C. June 11, 1917, to Jan. 30, 1919.
- THAYER, GRANVILLE M.
- TONRY, ALBERT J., Q. M. C.; Med. Corps. Dec. 10, 1917, to Dec. 5, 1918.
- TOWER, WILLIAM R., May 12, 1917. A. E. F., Sept. 7, 1917, to March 13, 1919. Anti-aircraft Art., C. A. C. St. Mihiel, Alsace, Luneville. Discharged April 15, 1919.
- TOWNE, EDWIN C., May 13, 1918. A. E. F., Sept. 1, 1918, to July 9, 1919. Med. Dept., Base section No. 4. Discharged July 23, 1919.
- WARNER, LEWIS P., Air Service. Dec. 15, 1917, to May 26, 1919.
- WELLINGTON, BENJAMIN, Engrs. Aug. 15, 1918, to April 12, 1919.
- WHITE, HARRY D., May 12, 1917. A. E. F., July 12, 1918, to Feb. 5, 1919. 302d and 163d Inf. Discharged Feb. 24, 1919.
- WHORF, PAUL F., Ord. Dept. Dec. 14, 1917, to Dec. 28, 1918.
- WILKINS, ALFRED E., Oct. 6, 1917. A. E. F., Oct. 4, 1918, to Jan. 18, 1919. Air Service. Discharged Feb. 26, 1919.

## M. A. C. IN THE WAR

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WILLEY, HAROLD C. C., Inf. Sept. 12 to Dec. 5, 1918.

WILLIAMS, DONALD, April 27, 1917. A. E. F., May 23, 1918, to Feb. 3, 1919. 8th and 309th F. A. Discharged Feb. 7, 1919.

WRIGHT, E. STANLEY, Aug. 17, 1917. B. E. F., March 23 to Nov. 15, 1918. British Royal Air Force. Discharged Dec. 26, 1918.

### CLASS OF 1916

AIKEN, HAROLD, Inf. Feb. 25 to Dec. 5, 1918.

ALLEN, CHESTER K., C. A. C. Aug. 31, 1917, to June 15, 1919.

ANDERSON, FRANK A., Naval Aviation. May 10 to Nov. 20, 1918.

ANDREWS, FRANCIS M., Jr., Air Service. Oct. 30, 1917, to Nov. 30, 1918.

ARMSTRONG, JAMES F., Air Service. Aug. 23, 1917. Still in service.

BARNES, DWIGHT F., Sept. 8, 1917. A. E. F., Sept. 26, 1918, to July 29, 1919. 186th Aero Squad. Discharged Aug. 16, 1919.

BARNES, FRED L., June 4, 1917. U. S. N. R. F. Mine-sweeping Fleet, Sept. 18, 1917, to Oct. 7, 1918, U. S. S. "Anderton." Discharged Feb. 9, 1920.

BEELER, LEON C., Q. M. C. Oct. 31, 1918, to March 24, 1919.

BISBEE, PHILIP E., May 25, 1918. A. E. F., July 4, 1918-. Inf., 76th Div.

BLANPIED, NELSON U., Dec. 15, 1917. A. E. F., May 10, 1918, to Aug. 29, 1919. 16th F. A., 4th Div. St. Mihiel Château-Thierry, Argonne. Army of Occupation. Regimental citation, Sept. 15, 1918. Discharged Sept. 2, 1919.

BRAZIL, WILLIAM H., Oct. 11, 1917. A. E. F., May 27, 1918, to June 1, 1919. Co. B, 303d Field Sig. Corps. St. Mihiel, Limey, Meuse-Argonne. Discharged June 9, 1919.

## M. A. C. IN THE WAR

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- CARDERELLI, EMILIO J., May 15, 1917. A. E. F., July 11, 1918, to June 10, 1919. Co. M, 302d Inf., 76th Div.; 301st Mil. Police. Discharged July 30, 1919.
- CARVER, FRANK W., April 9, 1917. A. E. F., Sept. 5, 1918, to July 25, 1920. Co. D, 3d Pioneer Inf. Meuse-Argonne. Discharged Aug. 1, 1920.
- CATE, REX M., Inf.; Med. Dept. Dec. 15, 1917-.
- CEDERSTROM, HJALMAR, Aug. 7, 1917. A. E. F., Oct. 27, 1917, to April 21, 1919. 96th Aero Squad. St. Mihiel, Meuse-Argonne. Discharged May 17, 1919.
- CHAMBERLIN, RAYMOND. Killed in action Sept. 26, 1918. (See page 51.)
- CHOATE, CARLISLE E., July 20, 1916. A. E. F., September, 1917, to April, 1919. Co. B, 344th Bn., 301st Brig., Tank Corps, Div. Hdqrs., 26th Div. Soissons, Chemin-des-Dames, Toul, Château-Thierry, St. Mihiel, Argonne. Wounded and gassed Oct. 4, 1918. Discharged May 6, 1919.
- COE, ALFRED L., F. A.; O. T. S. July 1 to Nov. 30, 1918.
- COLEMAN, ALBERT S., Sept. 1, 1917. A. E. F., Aug. 29, 1918, to June 26, 1919. Ambulance Corps, Evacuation Hospital No. 22. Army of Occupation. Discharged July 5, 1919.
- COLEY, WILLIAM S., Med. Corps. Aug. 23, 1918, to Jan. 17, 1919.
- COURCHENE, ALCIDE T., Oct. 7, 1917. A. E. F., Dec. 10, 1917, to June 2, 1919. Co. A, 504th Engrs. Discharged June 17, 1919.
- CURRAN, HARRY A., O. T. S. May 16 to Dec. 14, 1918.
- CUSHING, RAYMOND A., Troop M, 8th Cavalry. Nov. 26, 1917-.
- DANFORTH, GEORGE N., Jan. 5, 1918. A. E. F., April 30, 1918, to July 14, 1919. Bat. C, 104th and 304th F. A. Meuse-Argonne. Discharged July 16, 1919.
- DARLING, HOMER C., Jan. 5, 1918. A. E. F., April 16, 1918, to June 29, 1919. 306th Inf., 77th Div.; 132d Inf., 33d



## M. A. C. IN THE WAR

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Div. Somme, Meuse-Argonne, St. Mihiel. Awarded Distinguished Service Cross March 14, 1919. Discharged July 14, 1919.

DICKINSON, WILLIAM C., Med. Dept. May 13, 1918, to Dec. 10, 1919.

DINSMORE, DONALD S., May 14, 1917. A. E. F., Oct. 8, 1917, to June 22, 1918. 103d F. A. Seicheprey. Discharged Dec. 26, 1918.

DODGE, WALTER E., July 25, 1917. A. E. F., Sept. 4 to Dec. 4, 1918. Air Service. Discharged Dec. 30, 1918.

DOGGETT, WILLIAM H., July, 1917. A. E. F., September, 1917, to July 2, 1919. Co. C, 10th Engrs.; 34th Co., 20th Engrs.; Co. H, 29th Engrs.; Co. C, 329th Labor Bn.; 6th Engrs. and 12th Engrs., Service Co.; Co. C, 548th Engrs. Discharged July 17, 1919.

EDWARDS, MAURICE M., May 12, 1917. A. E. F. Co. E, 28th Inf.

ELDRIDGE, RAYMOND C., Oct. 4, 1917. A. E. F., July 5 to Dec. 11, 1918. Co. C, 119th Inf.; 291st Mil. Police, with British Army. Ypres, Voormepele, Mt. Kennel, Hindenburg Line, Bellicourt, Brancourt-Premont-Busigny, St. Souplet, Molain, Le-Cateau. Discharged Nov. 1, 1919.

ESTES, RALPH C., Aug. 22, 1917. A. E. F., March 11, 1918, to Oct. 27, 1919. 119th Inf. Discharged Nov. 1, 1919.

FERNALD, CHARLES H., U. S. N. R. F. July 16, 1917, to April 8, 1919.

FIELDING, LESTER E., Nov. 30, 1917. A. E. F., April 19, 1918, to April 4, 1919. Mil. Police, 26th Div. 2d Battle of the Marne, St. Mihiel, Meuse-Argonne. Discharged April 29, 1919.

FOX, EDWARD L., Med. Dept. July 20, 1918, to Jan. 17, 1919.

FRANCIS, CHARLES D., June 12, 1917. June 30, 1918-. Army Ambulance Service, Italian Contingent.

## M. A. C. IN THE WAR

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GILMORE, BENJAMIN A., Chemical Warfare Service. Oct. 5, 1917, to Dec. 5, 1918.

GIOIOSA, ALFRED A., Inf. June 26, 1918, to May, 1919.

GOOGINS, BURTON N., Inf.

GRAVES, R. WHEELER, Sept. 22, 1917. A. E. F., Nov. 19, 1917, to June 9, 1919. Co. A, 504th Engrs. Discharged June 17, 1919.

HALL, STANLEY W., Jan. 5, 1918. A. E. F., April 6, 1918, to Aug. 1, 1919. Hdqrs. Co., 308th Inf., 77th Div.; Hdqrs. Co., 9th Inf., 2d Div. St. Mihiel, Meuse-Argonne. Army of Occupation. Wounded Sept. 12, 1918. Discharged Aug. 28, 1919.

HARRIMAN, CHESTER K., July 9, 1917. U. S. N. R. F. Convoy duty, U. S. S. "Chattanooga;" Transport Service, U. S. S. "George Washington," September, 1918, to September, 1919. Discharged Sept. 2, 1919.

HART, REGINALD.

HASKELL, FRANK E., June 5, 1917. A. E. F., April 16, 1918, to Oct. 16, 1918. Co. A and Co. D, 15th M. G. Bn., 5th Div. St. Mihiel. Still in service.

HATHAWAY, CHARLES E., Jr., June 16, 1917. 33d and 45th Inf. Canal Zone, March, 1919. Discharged Aug. 10, 1919.

HEMENWAY, JUSTIN S., Sept. 1, 1916. A. E. F., July 29 to Dec. 28, 1919. 32d and 42d Inf. Still in service.

HENDRY, ARTHUR E., Oct. 3, 1917. A. E. F., May 1, 1918, to May 10, 1919. 304th Inf., 76th Div.; 307th Engrs., 82d Div. St. Mihiel, Toul, Meuse-Argonne. Discharged May 16, 1919.

HOBART, RALPH E., Feb. 25, 1918. A. E. F., June 29, 1918, to Oct. 15, 1919. 306th Field Remount Squad., Q. M. C. Meuse-Argonne. Discharged Oct. 22, 1919.

HULSIZER, ALLAN L., Air Service. Aug. 23, 1917, to Jan. 8, 1919.

## M. A. C. IN THE WAR

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- HUNT, REGINALD S., Aug. 5, 1917. A. E. F., Oct. 5, 1917, to March 31, 1919. Inf.; Hdqrs. Co., 102d F. A., 26th Div. Seicheprey, Xivray, Marne, St. Mihiel, Verdun. Discharged April 29, 1919.
- HUNTINGTON, CHARLES A., Jr., Inf. Aug. 23, 1917, to Feb. 11, 1919.
- JENNA, WILLIAM W., July 1, 1914. A. E. F. March 3, 1918, to date. Inf.; Assistant Military Attaché, Greece and Jugo-Slavia. Chevalier de la Légion d'Honneur, Medaille de Valeur Militaire (Greek). Still in service.
- KEEGAN, FRANK C., Inf.; F. A. Sept. 5, 1917, to Nov. 28, 1918.
- KILBON, RALPH G., May 19, 1917. A. E. F., Aug. 1, 1917, to April 22, 1919. Co. B, 16th Engrs. With B. E. F. April 5 to Nov. 19, 1918. Lys defensive, Meuse-Argonne. Discharged May 24, 1919.
- KING, EDWARD L., U. S. N. R. F. Dec. 12, 1917, to March 29, 1919.
- KNAPTON, GUY L., March 29, 1918. A. E. F., June 10, 1918, to Aug. 1, 1919. Co. M, 58th Inf., 4th Div. Marne, Vesle, Somme, Aisne-Marne, St. Mihiel, Meuse-Argonne. Discharged Aug. 7, 1919.
- LAIRD, KENNETH B. Died of disease Jan. 5, 1919. (See page 59.)
- LIEBER, CONRAD H., Med. Dept. Dec. 17, 1917 to April 3, 1919.
- LINDQUIST, ALBERT E., Inf. May 15, 1918, to Jan. 6, 1919.
- LITTLE, HAROLD G., Hospital Corps, U. S. N. R. F. Dec. 6, 1917, to Jan. 6, 1919.
- MACCORMAC, WILLIAM F., U. S. N. R. F. April 2, 1918, to Feb. 13, 1919.
- MAHAN, HAROLD B., Inf. May 5 to Dec. 20, 1918.
- MANN, VICTOR L.
- MCCULLOCK, NORMAN E., Ord. Dept.

## M. A. C. IN THE WAR

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- MONTGOMERY, THOMAS M., May, 1917. A. E. F., July, 1918-.  
304th Ammunition Train, 76th Div.
- MORTON, WALTER J., U. S. N. R. F. May 12 to Nov. 1, 1917.
- MOSS, EARLE C., C. A. C. Aug. 31 to Dec. 7, 1918.
- MURPHY, JOHN W., December, 1917. A. E. F., March 10,  
1918, to Aug. 1, 1919. 23d Engrs. Château-Thierry,  
Argonne, Belleau Wood, St. Mihiel. Wounded at Château-  
Thierry. Discharged August, 1919.
- NASH, CLAYTON W., Inf.
- NICHOLSON, JAMES T., Inf. May 16, 1918, to Jan. 28, 1919.
- O'BRIEN, EDWIN F., October, 1917. A. E. F., July 5, 1918,  
to April 6, 1919. 301st Ammunition Train, 76th Div.;  
115th San. Train, 40th Div. Discharged May 1, 1919.
- PALMER, GEORGE B., Inf. Oct. 5, 1917, to Nov. 29, 1918.
- PHELPS, SANFORD W., Band; Inf. Oct. 6, 1917, to Feb. 1,  
1919.
- PIERCE, JAMES D., Med. Dept. Dec. 20, 1917, to Dec. 20, 1918.
- PLAISTED, PHILIP A., U. S. N. R. F. May 1, 1917, to Jan. 15,  
1919.
- POTTER, DAVID, Inf. Aug. 27, 1917, to Jan. 30, 1919.
- PROUTY, STANLEY M. Philippine Constabulary, July, 1916,  
to January, 1918. 15th Regt. Inf., U. S. A., January, 1918,  
to date.
- RAY, GEORGE B., Med. Dept.; U. S. N. R. F. Aug. 7, 1918,  
to July 3, 1919.
- RICH, GILBERT W., Inf. May 17, 1917, to Dec. 20, 1918.
- RICHARDS, EVERETT S. Philippine Constabulary, July, 1916.  
U. S. A., May 15, 1918. Siberia, Aug. 11, 1918, to April  
10, 1919. 27th and 30th Inf. Discharged April 11, 1919.
- ROGERS, TYLER S., Q. M. C. Feb. 1, 1918, to Sept. 24, 1919.
- ROWE, LOUIS V., Air Service. Oct. 15, 1917, to Dec. 5, 1918.
- RYAN, WILLIAM E., Jr., Inf. Sept. 21, 1917, to April 29, 1919.

## M. A. C. IN THE WAR

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- SANDER, BENJAMIN C. L., Inf. July 24 to Dec. 10, 1918.
- SANDERSON, EVERETT S., May 3, 1917. A. E. F., Oct. 3, 1917, to July 19, 1919. Med. Dept., 26th Div. Marne. Discharged July 25, 1919.
- SAUTER, WILLIAM H., Med. Corps. Sept. 4, 1918-.
- SCHEUFELE, FRANK J., U. S. N. R. F., June 8, 1917. Patrol duty. U. S. S. "Satilla," July 7, 1917, to Jan. 1, 1918. Transport Service, U. S. S. "Wilhelmina," June 13 to Oct. 24, 1918. Discharged June 9, 1919.
- SCHLOTTERBECK, LEWIS, Air Service. Feb. 2, 1918, to March 21, 1919.
- SHERINYAN, DONALD, Dec. 14, 1917. Air Service. F. A.
- SIMMONS, PEREZ, Oct. 28, 1917. A. E. F., Jan. 17, 1918, to March 14, 1919. 11th Co., 20th Engrs. Discharged May 2, 1919.
- SMITH, PHILIP L., June 1, 1917. A. E. F., March, 1918-. 2d Cavalry. Gievres, Verdun.
- STEARNS, FREDERICK C., Inf. Dec. 12, 1917, to Jan. 15, 1919.
- STOUGHTON, RICHARD, Sept. 21, 1917. A. E. F., October, 1918, to July, 1919. Inf.; Engrs. Discharged July 18, 1919.
- STRAUSS, ABRAHAM. A. E. F.
- TAFT, RICHARD C., Q. M. C. Dec. 3, 1917, to May 5, 1919.
- TARBELL, HERBERT H., Inf. Oct. 6, 1917, to Feb. 12, 1919.
- TOPHAM, ALFRED, Sept. 21, 1917. A. E. F., Feb. 27 to Nov. 25, 1918. Co. E, 9th Inf. Château-Thierry, Vaux, Marne, Soissons, St. Mihiel, Champagne. Wounded July 18 and Oct. 3, 1918. Discharged Jan. 2, 1919.
- VERBECK, HOWARD G., Air Service. Sept. 7, 1917, to Aug. 12, 1919.
- WALKDEN, HERBERT H., Oct. 4, 1917. A. E. F., July 12, 1918, to Aug. 17, 1919. 301st Ammunition Train, 76th Div.; Co. E, 164th Inf.; 18th Inf. Discharged Aug. 19, 1919.
- WALKER, HENRY M., Inf. Sept. 20, 1917, to Jan. 4, 1919.

## M. A. C. IN THE WAR

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WENTWORTH, EVERETT L., April 6, 1917. A. E. F., Sept. 25, 1917, to March 25, 1919. Co. H, 103d Inf., 26th Div. Château-Thierry, St. Mihiel, Argonne. Discharged April 17, 1919.

WHEELER, ROBERT K., Feb. 5, 1918. A. E. F., June 21, 1918, to March 30, 1919. 10th Co., 3d Regt., Air Service. Discharged April 15, 1919.

WILDON, CARRICK E., May 15, 1918. A. E. F., Sept. 15, 1918, to Feb. 1, 1919. 329th Inf. Discharged Feb. 15, 1919.

WOOLLEY, HAROLD C., Engrs. July 21, 1918, to Jan. 28, 1919.

### CLASS OF 1917

ALCOTT, WILLIAM J., Jr., June 25, 1917. A. E. F., July 28, 1917, to April 28, 1919. Co. E, 14th Engrs., 1st Div. Somme, Aisne-Marne, Meuse-Argonne. Discharged May 3, 1919.

ANDREWS, ROBERT M.

AVERY, HAZELTON S., Oct. 14, 1917. A. E. F., April 2, 1918, to April 2, 1919. Co. B, 30th Inf.; 9th M. G. Bn., 3d Div. Aisne, Champagne-Marne, Fismes, Meuse-Argonne, St. Mihiel. Army of Occupation. Gassed July 6, 1918. Discharged April 7, 1919.

BABCOCK, PHILIP R., May 12, 1917. A. E. F., Nov. 2, 1917, to Aug. 1, 1919. 88th Aero Squad. Champagne-Marne, Aisne-Oise, St. Mihiel, Meuse-Argonne, Toul, Château-Thierry, Vismes, Verdun. Army of Occupation. Awarded Distinguished Service Cross Aug. 11, 1918; French Croix de Guerre, with gold star, for action July 19 and 24, 1918. Discharged Aug. 27, 1919.

BAER, RICHARD M., July 29, 1918. A. E. F., Aug. 24, 1918, to Oct. 28, 1919. Gen. Hdqrs. Discharged Oct. 29, 1919.

BELL, ALFRED W., Jr., F. A. Dec. 7, 1917, to Sept. 12, 1919.

BOLES, ROBERT S., U. S. N. R. F. April 5, 1917, to Dec. 18, 1918.

## M. A. C. IN THE WAR

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- BONN, WESLEY C., Air Service. Dec. 13, 1917, to Dec. 11, 1918.
- BOOTH, ALFRED, Jan. 7, 1918. Naval Aviation. Queenstown, Ire., Aug. 5, to Dec. 1, 1918. Discharged Feb. 10, 1919.
- BORDEN, RAYMOND V., Oct. 4, 1917. A. E. F., July 4, 1918, to May 27, 1919. Co. F, 302d Inf., 76th Div. Discharged June 4, 1919.
- BOYCE, HAROLD P., U. S. N. R. F. Nov. 28, 1917, to Feb. 5, 1919.
- BRAINARD, DWIGHT G., Inf. June 26, 1918, to April 28, 1919.
- BRECK, RICHARD W., July 25, 1917. A. E. F., Oct. 5, 1917, to Oct. 10, 1918. Co. C, 102d M. G. Bn., 26th Div. Chemin-des-Dames, Toul, Seicheprey. Wounded June 10, 1918; loss of right leg. Discharged Jan. 7, 1920.
- BRECKENRIDGE, EARL, Inf. Oct. 21, 1914, to July 7, 1920.
- BUCKMAN, LEWIS T., Inf.; O. T. S. May 8 to July 25, 1917.
- BURLEIGH, ARTHUR L., July 8, 1918. A. E. F., Sept. 30 to Dec. 22, 1918. Hdqrs. Co., 40th C. A. C. Discharged Dec. 28, 1918.
- BUTTRICK, DAVID H., Q. M. C. Dec. 5, 1917, to March 3, 1919.
- CLARK, WALTER T., Inf. April 24 to Dec. 10, 1918.
- CLOUGH, CHARLES H. Died of disease April 13, 1918. (See page 51.)
- CROSS, WALTER I. Died of disease Feb. 27, 1919. (See page 52.)
- CURTIN, CHARLES W., U. S. N. R. F. Nov. 5 to Dec. 31, 1918.
- DAVIS, MONSELL H., Inf. May 28 to Nov. 25, 1918.
- DAWSON, HARRY C., Inf. Sept. 20, 1917, to April 28, 1919.
- DAY, JAMES H., May 10, 1917. A. E. F., Sept. 7, 1917, to Aug. 1, 1919. 9th Inf., 2d Div. Château-Thierry, Soissons, St. Mihiel, Champagne, Meuse-Argonne, Verdun.

## M. A. C. IN THE WAR

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Army of Occupation. Wounded by machine gun bullet. Cited in Division Orders July 1, 1918; cited by French Corps and awarded Croix de Guerre October, 1918. Still in service.

DEMOTT, HAROLD C., Inf. March 31, 1917, to July 15, 1918.

DILLON, THOMAS S., Nov. 22, 1917. A. E. F., Jan. 7, 1918, to March 3, 1919. Inf. Discharged March 19, 1919.

DOHERTY, PAUL E., April 23, 1917. U. S. N. R. F. Patrol duty, Aug. 24, 1917, to May 5, 1919. Discharged May 20, 1919.

DUDLEY, LOFTON L., Inf. Aug. 27, 1917, to Feb. 17, 1919.

DUNN, ARTHUR P., March 24, 1917. A. E. F., June 14, 1917, to Oct. 15, 1918. Co. G, 28th Inf., 1st Div. Luneville, Cantigny, Château-Thierry, Soissons. Wounded, right hand and head, at Cantigny, May 31, 1918; elbow joint shattered at Soissons, July 18, 1918. Discharged Jan. 29, 1919.

EDWARDS, FRANZ G., Inf. May 12, 1917, to Sept. 15, 1919.

ELLIOTT, RALPH W., Oct. 18, 1917. A. E. F., July 4, 1918, to July 4, 1919. 302d Inf., 76th Div.; 2d Pioneer Inf., Engr. Corps. Discharged July 9, 1919.

EVERBECK, GEORGE C., Inf. May 11, 1917, to Aug. 22, 1919.

FARWELL, ALFRED A. Died from wounds Dec. 29, 1918. (See page 53.)

FEARING, RALPH W., Jan. 5, 1918. A. E. F., April 20, 1918, to Jan. 21, 1919. Inf. Juvigny, Argonne. Wounded Oct. 5, 1918. Discharged Feb. 9, 1919.

FISHER, GEORGE B., Sept. 22, 1917. A. E. F., Nov. 10, 1918, to March 3, 1919. 164th Inf., 41st Div. Discharged March 3, 1919.

GILLETTE, GLENN C., Sept. 21, 1917. A. E. F., July 12, 1918, to March 6, 1919. 301st Ammunition Train, Inf., 76th Div. Discharged April 3, 1919.

GOLDSTEIN, MAURICE, U. S. N. R. F. April 26, 1918, to July 1, 1919.



## M. A. C. IN THE WAR

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- GRAHAM, LELAND J., Air Service. Oct. 6, 1917, to March 4, 1919.
- GRAYSON, EMORY E., F. A.; O. T. S. Oct. 28 to Dec. 5, 1918.
- GRISWOLD, LEON S., F. A. Oct. 17 to Dec. 17, 1918.
- GROFF, HOWARD C., Vet. Corps; Med. Dept. Dec. 20, 1917, to Dec. 14, 1918.
- GURSHIN, CARL A., U. S. N. R. F. July 16, 1917, to April 22, 1919.
- GUSTETTER, RAY H., Co. C., 101st M. G. Bn. A. E. F.
- HAAREN, PAUL J., Naval Aviation.
- HAGELSTEIN, CHARLES H., May 8, 1917. A. E. F., Oct. 21, 1918, to Nov. 1, 1919. 301st Engrs., 76th Div.; Co. F, 45th C. A. C. Still in service.
- HARRINGTON, ALBERT T., July 25, 1917. A. E. F., Sept. 8, 1917-. Bat. E, 101st F. A., 26th Div.; 147th F. A. La Chappelle, Château-Thierry, Vesle, Soissons, Juvigny, Verdun, Argonne. Gassed Aug. 11, 1918; wounded Sept. 29, 1918. Discharged Jan. 8, 1919.
- HARRIS, WARREN T. Died of disease Oct. 9, 1918. (See page 56.)
- HARTFORD, CLAUDE E., Sig. Corps.
- HAUCK, ROLAND M., U. S. N. R. F. June 24, 1918, to Jan. 16, 1919.
- HENDERSON, ELLIOTT, May 14, 1917. A. E. F., Sept. 7, 1917, to June 29, 1919. M. G. Bn., 26th Inf., 1st Div. Cantigny, Soissons, St. Mihiel, Argonne. Discharged July 7, 1919.
- HENNINGER, ROSWELL W., Air Service. Sept. 17, 1917, to Feb. 1, 1919.
- HIGGINBOTHAM, HARRY H., Med. Dept. Nov. 20, 1917-.
- HOLDER, RALPH C., San. Corps, Chemical Warfare Service. June 3, 1918, to Dec. 20, 1919.
- HOLT, FRANCIS S., U. S. N. R. F. April 5, 1917, to Dec. 23, 1918.

## M. A. C. IN THE WAR

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- HYDE, STANLEY W., June 26, 1916. A. E. F., Oct. 3, 1917, to July 27, 1919. Field Laboratory, Med. Corps, 101st San. Train, 26th Div. Discharged Aug. 1, 1919.
- IRVING, WILLIAM R., May 15, 1917. A. E. F., July 8, 1918, to Jan. 10, 1919. 26th Inf., 1st Div. St. Mihiel, Argonne, Verdun. Wounded in leg and hand Oct. 4, 1918. Discharged May 29, 1919.
- JOSLYN, EDWYN D., Feb. 13, 1918. A. E. F., May 10, 1918, to July 27, 1919. Co. A, 47th Inf.; Co. G, 11th Inf. Château-Thierry, Vesle, Argonne. Discharged Aug. 1, 1919.
- KELSEY, EDMUND D., F. A. May 19, 1918, to Jan. 18, 1919.
- KELSEY, LINCOLN D., Inf. Sept. 17, 1918, to Jan. 16, 1919.
- LANCEY, CLIFFORD S., Med. Corps. Dec. 17, 1917, to Dec. 18, 1918.
- LARSON, FREDERIC C., F. A. Jan. 14 to Nov. 30, 1918.
- LATHAM, PAUL W., Air Service. Dec. 10, 1917, to Jan. 8, 1919.
- LAWRENCE, MILFORD R., U. S. N. R. F. Aug. 27, 1917, to Aug. 14, 1919.
- LEIGH, JAMES A., May 23, 1917. A. E. F., Oct. 5, 1917, to July 26, 1919. 104th Inf., 26th Div. Seicheprey, Chemin-des-Dames, Marne, Toul, Belleau Wood. Wounded Sept. 9, 1918. Discharged Aug. 1, 1919.
- LIGHT, BROOKS, U. S. N. R. F. Nov. 16, 1917, to April 21, 1919.
- LIVERMORE, WILLIAM T., Q. M. C., M. T. C. Dec. 4, 1917, to Dec. 4, 1918.
- LYDIARD, HARRY C., Air Service. Nov. 10, 1917, to March 1, 1919.
- MACK, WALTER A., Aug. 9, 1917. A. E. F. 8th Inf. Army of Occupation. Still in service.
- MACLEOD, DANIEL J., Inf. Sept. 3, 1918, to May 28, 1919.

## M. A. C. IN THE WAR

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MARCHANT, HORACE G., Air Service. Jan. 17 to Dec. 5, 1918.

MARS, MALCOLM R.

MATHER, FRED, March 11, 1916. C. E. F., Dec. 6, 1916, to April 28, 1917. 24th and 148th Bn. Inf. Vimy Ridge. Wounded at Vimy April 9, 1917. Discharged Aug. 2, 1918.

MAURER, ERWIN E., Sig. Corps, Air Service. Jan 28, 1918, to May 1, 1919.

MAYO, FRANK W., Inf.; O. T. S. Oct. 1 to Nov. 23, 1918.

McNAMARA, MICHAEL J., Inf. Nov. 22, 1917, to Dec. 7, 1918.

MERRILL, DANA O., Inf.; O. T. S. July 23 to Nov. 23, 1918.

NASH, HERMAN B., Sept. 23, 1917. A. E. F., Sept. 26, 1918, to July 29, 1919. Co. K, 132d Inf., 33d Div. St. Mihiel. Discharged Aug. 15, 1919.

NASON, LEONARD H., July 6, 1917. A. E. F., March 29, 1918, to Jan. 4, 1919. Bat. A, 76th F. A. Champagne-Marne, St. Mihiel, Argonne, Meuse. Wounded July 23 and Oct. 5, 1918. Cited for gallantry July 14 and 15, 1918, Gen. Hdqrs. Wrecked on U. S. S. "Northern Pacific." Discharged Jan. 31, 1919.

NATH, MORRIS, 301st Inf., 76th Div. A. E. F.

NELSON, JOHN B., Inf.; Med. Corps. May 10, 1918, to July 19, 1919.

NESTLE, WILLIAM J., Air Service. April 26, 1918, to Jan. 28, 1919.

NIMS, HOMER W., Air Service. July 29, 1917, to Jan. 17, 1919.

NOYES, JOHN W., Co. D., 101st Engrs. A. E. F.

NOYES, SAMUEL V., Nov. 13, 1917. A. E. F., July 15, 1918, to March 5, 1919. 66th C. A. C. Discharged March 20, 1919.

PICARD, WALTER D., May 29, 1917. A. E. F., Aug. 17, 1918, to March 17, 1919. 72d C. A. C. Discharged April 19, 1919.

## M. A. C. IN THE WAR

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- PIERCE, HAROLD B., Inf. May 14, 1917, to Jan. 14, 1918.
- POLAND, ROBERT R., March 30, 1917. A. E. F., Oct. 9, 1917, to April 1, 1919. Mil. Police, 26th Div. Discharged April 29, 1919.
- PORTER, WAYLAND R., Oct. 6, 1917. A. E. F., July 14, 1918, to July 24, 1919. Co. A, 301st Engrs., 76th Div. St. Mihiel. Discharged July 31, 1919.
- RANDALL, EARLE McN., July, 1917. A. E. F., August, 1918, to July, 1919. 2d Div., Marine Corps. Still in service.
- RICHARDSON, LEWIS E., September, 1917. A. E. F., July 5, 1918, to July 20, 1919. Co. F, 302d Inf., 76th Div.; Prisoner of War Escort Co. No. 229. Discharged July 26, 1919.
- RODGER, RAYMOND M., Chemical Warfare Service. May 26 to Dec. 13, 1918.
- ROGERS, ROLAND W., Aug. 21, 1917. A. E. F., Sept. 26, 1917, to July 13, 1919. Co. E, 101st Engrs., 26th Div. Château-Thierry, St. Mihiel, Argonne, Soissons, Toul. Discharged July 21, 1919.
- RORSTROM, HANS A., C. A. C.; Inf. Dec. 14, 1917, to Dec. 2, 1918.
- ROSS, LOUIS W., May 12, 1917. A. E. F., Sept. 1, 1917, to Jan. 5, 1919. 166th Inf., 42d Div. Lorraine Front, Champagne, Château-Thierry. Wounded March 8, 1918; gassed Aug. 5, 1918. Discharged Jan. 15, 1919.
- RUPPEL, ARTHUR D., Nov. 22, 1915. A. E. F., June 4, 1918, to Oct. 15, 1918. 20th F. A., 5th Trench Mortar Bat., 1st F. A. St. Mihiel. Still in service.
- SAIDEL, HARRY S., Inf. June 22 to Nov. 25, 1918.
- SAUTER, JOHN M., Inf. April 26, 1918, to Feb. 5, 1919.
- SAVILLE, WILLIAM, JR., May 15, 1917. A. E. F., July 8, 1918, to Oct. 4, 1919. M. G. Co., 304th Inf.; Co. B, 163d Inf.; Prisoner of War Escort Co. No. 228. Discharged Oct. 9, 1919.

## M. A. C. IN THE WAR

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- SCHAEFER, LEONARD C., Inf. June, 1918, to Nov. 23, 1919.
- SCHUR, ARTHUR L., C. A. C.
- SCOTT, GEORGE A., Inf. July 5, 1918, to Jan. 15, 1919.
- SHUMWAY, PAUL E., Aug. 6, 1917. A. E. F., July 13 to Dec. 17, 1918. Naval Aviation. Patrol over North Sea and eastern coast. Still in service.
- SIMONS, CLIFTON H., Q. M. C. Sept. 5 to Dec. 18, 1918.
- SMITH, HAYDEN H., June 11, 1914. U. S. N. R. F. Convoy duty, August, 1917, to July, 1918. Still in service.
- SMITH, HERBERT D., Nov. 22, 1917. U. S. N. R. F. Sub-chaser, July, 1918, to July, 1919. Discharged Sept. 23, 1919.
- SMITH, RICHARD W., Inf.; O. T. S.; F. A. July 23 to Dec. 6, 1918.
- SPAULDING, ALMON W., June 10, 1917. A. E. F., Aug. 20, 1917, to June, 1919. Ambulance service with the French Army. S. S. U. No. 539 and No. 610. Aisne, Champagne, Flanders. Citations: awarded Croix de Guerre by 5th Div., French Army; commended for bravery by U. S. A., Gen. Hdqrs, March, 1918. Discharged June 15, 1919.
- SQUIRES, PAUL R., May 14, 1917. A. E. F., Sept. 14, 1918, to May 6, 1919. F. A.; Artillery Aerial Observer, Air Service; 104th Aero Squad. Discharged May 10, 1919.
- STEARNS, CARLTON M., Dec. 9, 1917. A. E. F., April 2, 1918, to April 20, 1919. Medical Department, Base Hospital No. 116. Discharged May 15, 1919.
- STILES, A. RALPH, Inf. Jan. 17 to Nov. 30, 1918.
- STOWELL, HAROLD T., U. S. N. R. F. Dec. 15, 1917, to Feb. 1, 1919.
- STURTEVANT, WARNER B., Oct. 9, 1917. A. E. F., Sept. 29, 1918, to July 19, 1919. Ord. Dept. Discharged July 23, 1919.
- SWETT, FRANCIS S., May 14, 1917. 30th Inf.; 41st C. A. C. Still in service.

## M. A. C. IN THE WAR

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TERRILL, HERBERT W., May 1, 1918. A. E. F., June 27, 1918, to May, 1919. Co. D, 113th Inf. Meuse-Argonne. Citation: Oct. 12, 1918. Discharged May 23, 1919.

THAYER, WILLIAM W. Died of disease April 19, 1918. (See page 61.)

TUCKER, ARTHUR C., May 1, 1917. A. E. F., May 10, 1918, to March 9, 1919. Co. L, 107th Inf., 27th Div. Somme, Ypres. Discharged April 2, 1919.

TUCKER, LEE H., Inf. Oct. 26, 1917, to Feb. 5, 1919.

TUTHILL, SAMUEL F., Inf. 1917 to Sept. 26, 1919.

UPSON, EVERETT L., Aug. 9, 1917. 44th Inf. Still in service.

WALBRIDGE, HENRY B., Oct. 3, 1917. A. E. F., July 16, 1918, to April 26, 1919. Inf.; Bat. C, 302d F. A. St. Mihiel. Discharged April 30, 1919.

WARREN, HAROLD M., San. Corps, Med. Dept. Oct 25, 1918, to Aug. 18, 1919.

WARREN, JAMES J., Sept. 23, 1917. A. E. F., July, 1918, to July, 1919. 317th Field Sig. Bn., 76th Div. St. Mihiel, Meuse-Argonne. Discharged July 10, 1919.

WEBSTER, FRANK C., Oct. 5, 1917. A. E. F., July 12, 1918, to February, 1919. 301st and 116th Ammunition Train, Inf. Discharged March 4, 1919.

WESTMAN, ROBERT C. Died from wounds Aug. 10, 1918. (See page 62.)

WHEELER, CHESTER W., June, 1917. A. E. F., July 28, 1917, to April 27, 1919. 14th Engrs. Arras-Bahaume sector, Aisne-Marne, Meuse-Argonne. Discharged May 2, 1919.

WHITCOMB, WARREN D., San. Corps, Med. Dept. Aug. 26 to Dec. 12, 1918.

WHITNEY, JOSEPH F., F. A. Sept. 10, 1917, to Jan. 17, 1919.

WILBER, CHARLES R. Killed in action Sept. 29, 1918. (See page 62.)

WILLIAMS, ARTHUR F., Aug. 9, 1917. A. E. F., April 2, 1918, to Feb. 14, 1919. 30th Inf., 3d Div. Château-Thierry,

## M. A. C. IN THE WAR

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Marne, St. Mihiel, Verdun, Argonne. Wounded July 24, 1918, Marne; Oct. 11, 1918, Argonne. Awarded Croix de Guerre with the palm; regimental citation. Discharged Aug. 15, 1919.

WILLIAMS, HERBERT C., June 15, 1918. Inf.; F. A. Still in service.

### CLASS OF 1918

ALLEN, LELAND C., San. Corps, Med. Dept. June 4, 1917, to July 22, 1919.

ALLEN, RALPH E., March 12, 1917. U. S. N. R. F. Sea service Dec. 10, 1917, to July 30, 1918. Discharged April 15, 1919.

BABBITT, FRANK M., Engrs. Sept. 5, 1917, to Dec. 3, 1918.

BABBITT, GEORGE K., June 5, 1918. A. E. F., April 26, 1918, to April 18, 1919. Co. I, 305th Inf., 77th Div. Oise-Aisne, Meuse-Argonne. Divisional citation September, 1918. Discharged May 10, 1919.

BAINBRIDGE, FRANK B., May 15, 1918. A. E. F., March 5 to Nov. 25, 1918. 22d and 140th Aero Squad. Injured in airplane crash June 11, 1918. Discharged April 16, 1919.

BAKER, FOSTER K., Air Service. Dec. 7, 1917, to Jan. 6, 1919.

BARBOUR, FRANCIS C., Med. Dept. June 29, 1917, to Feb. 15, 1919.

BARTON, GEORGE W., Inf.; O. T. S. May 15 to June 3, 1918.

BINKS, FRANK J., Sept. 21, 1917. A. E. F., June 29, 1918, to July 20, 1919. Med. Dept. Discharged July 25, 1919.

BOAZ, WILLIAM H., Inf. May, 1917, to Jan. 7, 1919.

BOYD, ROBERT L., Inf. May 15, 1918, to May 1, 1919.

BRUCE, WALTER G., Sig. Corps. Sept. 5, 1918, to Jan. 9, 1919.

BUCHANAN, WALTER G., Naval Aviation. May 23, 1918, to Feb. 7, 1919.

BURTCH, CHESTER S., Inf. October, 1917.

## M. A. C. IN THE WAR

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- CAMERON, WALTER L., June, 1917. A. E. F., May, 1918-. Med. Dept.
- CANLETT, FRANKLIN H., May 21, 1918. F. A. Still in service.
- CAPEN, HOWARD B., Sept. 21, 1917. A. E. F., July 4, 1918, to July 4, 1919. Co. K, 302d Inf., 76th Div.; Co. C, 2d Pioneer Inf. Discharged July 9, 1919.
- CARLSON, FRED A., U. S. N. R. F. Aug. to Dec. 22, 1918.
- CARTER, THOMAS E. Killed in action Nov. 4, 1918. (See page 50.)
- CHAMBERS, ROGER J., Inf.; Air Service. Sept. 22, 1917, to Jan. 15, 1919.
- CHAPMAN, JOHN A., F. A. May 15, 1918, to Feb. 4, 1919.
- CHEFFERDS, LOUIS D., Inf.; Med. Corps. May 7, 1917, to March 13, 1919.
- CLAPP, ROGER F., Sept. 7, 1917. A. E. F., Aug. 4, 1917, to June 1, 1919. Ambulance Service, S. S. U. No. 634. Discharged March 24, 1919.
- COTTON, ELWYN P., Nov. 30, 1917. U. S. N. R. F. Convoy duty, U. S. S. "Columbia." Discharged July 29, 1919.
- DAVIS, DWIGHT S., Naval Aviation. June 3, 1918, to Feb. 6, 1919.
- DEMERRITT, FRANKLIN, Inf.; O. T. S.; F. A. July 22 to Dec. 9, 1918.
- DOWD, WILLIAM L., Naval Aviation. May 10, 1918, to March 26, 1919.
- DURFEE, NORMAN O., April 13, 1917. A. E. F., Sept. 1, 1917, to April 27, 1919. 101st Ammunition Train, 26th Div. Chemin-des-Dames, Toul, Seicheprey, Aisne-Marne, St. Mihiel, Verdun. Discharged April 29, 1919.
- EDES, DAVID O. N. Killed in action Aug. 9, 1918. (See page 53.)
- EDWARDS, MILLET.



## M. A. C. IN THE WAR

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- ELLIS, RALPH C., May 15, 1917. A. E. F., June 8, 1918, to July 1, 1919. M. G. Co., 5th Regt., Marine Corps, St. Mihiel, Mont Blanc, Argonne. Shrapnel wound, left arm. Discharged Aug. 13, 1919.
- EMMERICH, LOUIS P., Inf. May 27, 1918-.
- ERICKSON, GEORGE E., Inf. May 16 to Dec. 5, 1918.
- FAIRCHILD, ROBERT D., Nov. 8, 1917. A. E. F., April 16, 1917, to Aug. 3, 1919. Inf.; 2d Vet. sect., 2d Div. Château-Thierry, Soissons, St. Mihiel, Champagne, Argonne. Discharged Aug. 16, 1919.
- FANEUF, LEO J., Air Service. June 7, 1917, to Sept. 15, 1919.
- FARRAR, DELWIN B., Inf.; Sig. Corps; Air Service. April 22, 1917, to Jan. 6, 1919.
- FELLOWS, HAROLD C., Oct. 5, 1917. A. E. F., May 9, 1918, to April 20, 1919. Inf.; Med. Dept., Field Hospital No. 42. Meuse-Argonne. Discharged April 25, 1919.
- FLETCHER, WALTER F., Oct. 28, 1917. A. E. F., March 29, 1918, to June 16, 1919. Co. E, 23d Engrs. Discharged June 21, 1919.
- FOLEY, WILLIAM A., Inf. May 15 to Dec. 5, 1918.
- FOSTER, HAMILTON K. Killed in action Oct. 4, 1918. (See page 54.)
- FOSTER, ROY W., Dec. 13, 1917. A. E. F., June 30, 1918, to July 11, 1919. Med. Dept., 601st Engrs. Discharged July 17, 1919.
- FRANCIS, DONALD S., June 9, 1917. A. E. F., September, 1917, to Sept. 9, 1918. 101st Inf., 26th Div.; 74th Inf., 12th Div. Chemin-des-Dames, Toul, Vaux, Château-Thierry. Gassed at Château-Thierry. Discharged Sept. 23, 1919.
- FRASER, CHARLES A., May 12, 1917. A. E. F., November, 1917, to April 28, 1919. Co. D, 168th Inf., 42d Div. Champagne, Château-Thierry, Lorraine, Meuse-Argonne. Army of Occupation. Gassed and wounded. Awarded Croix de Guerre April, 1918. Discharged May 29, 1919.

## M. A. C. IN THE WAR

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- FRELICK, ARTHUR L., April 29, 1917. A. E. F., Oct. 3, 1917, to April, 1919. Co. B, 101st Ammunition Train, 26th Div. Toul, Château-Thierry, Seicheprey, St. Mihiel, Verdun. Discharged April 29, 1919.
- FULLER, CAMILLE B., Aug. 16, 1917. A. E. F., Nov. 23, 1917, to July 22, 1919. 68th and 102d Aero Squad. Château-Thierry, Toul, Champagne-Marne, St. Mihiel, Meuse-Argonne. Discharged July 26, 1919.
- GASSER, THOMAS J., Inf. Oct. 5, 1917, to Jan. 15, 1919.
- GIFFORD, FLAVEL M., Oct. 4, 1917. A. E. F., Jan. 11, 1918, to July 27, 1919. Co. H, 302d Inf., 76th Div. Discharged Aug. 1, 1919.
- GILLETTE, NATHAN W., Nov. 26, 1917. A. E. F., May 10, 1918, to Aug. 1, 1919. Bat. B, 16th F. A., 4th Div. Marne, Vesle, St. Mihiel, Meuse-Argonne. Discharged Jan. 14, 1920.
- GOODRIDGE, GEORGE L., June 6, 1917. A. E. F., Sept. 7, 1917, to April 6, 1919. Co. G, 101st Inf., 26th Div. Chemin-des-Dames, Toul, Aisne-Marne, Château-Thierry, St. Mihiel, Troyon, Meuse-Argonne, Verdun. Awarded French Legion of Honor; Distinguished Service Cross Feb. 19, 1919, and Croix de Guerre for action of Nov. 9, 1918; cited in G. O. No. 74, Aug. 31, 1918; G. O. No. 88, Oct. 16, 1918, and others. Discharged May 1, 1919.
- GOODWIN, WILLIAM I., Jan. 5, 1918. A. E. F., April 15, 1918, to May 22, 1919. Co. G, 306th Inf., 77th Div.; M. G. Co., 125th Inf., 32d Div. Château-Thierry, Juvigny, Soissons, Meuse-Argonne. Army of Occupation. Discharged May 28, 1919.
- GORDON, FREDERICK G., June 1, 1917. A. E. F., Sept. 20, 1917, to March 28, 1919. Co. D., 101st Inf., 26th Div. Château-Thierry, St. Mihiel, Chemin-des-Dames. Discharged April 28, 1919.
- GRAY, MILTON B., April 19, 1917. U. S. N. R. F. Sea Service, Feb. 22, 1918, to May 4, 1919. Sub-chaser, Mediterranean Fleet. Discharged Aug. 30, 1919.

## M. A. C. IN THE WAR

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GRAYSON, FORREST, Inf.; Air Service. Sept. 19, 1917, to June 3, 1919.

HAINES, FOSTER K., Med. Dept. May 10, 1918, to July 1, 1919.

HANCE, FORREST S., Inf. May 14, 1917, to July 28, 1919.

HARWOOD, RALPH W., May 16, 1917. A. E. F., Sept. 15, 1917, to May 22, 1919. 102d Inf., 26th Div.; 353d Inf., 89th Div. Chemin-des-Dames, Toul, Château-Thierry, Meuse-Argonne. Awarded Distinguished Service Cross for bravery in action in battle north of Verdun. Awarded Croix de Guerre April, 1919. Discharged June 12, 1919.

HAWLEY, ROBERT D., Nov. 20, 1917. A. E. F., Sept. 15, 1918, to June 30, 1919. 304th Inf., 76th Div. Discharged July 22, 1919.

HAYES, OLIN H., F. A. Aug. 26, 1918, to Jan. 10, 1919.

HEFFRON, PAUL J., Oct. 4, 1917. A. E. F., July 5, 1918, to Aug. 30, 1919. Co. F, 302d Inf., 76th Div.; Co. B, 163d Inf., 41st Div.; Co. B, Postal Express Service. Discharged Sept. 14, 1919.

HIGGINS, LEO C., June 2, 1917. A. E. F., Aug. 7, 1917, to April 23, 1919. Ambulance Service, S. S. U. No. 510, with French Army. Aisne, Argonne, Vesle, Verdun. Army of Occupation. Discharged April 28, 1919.

HILL, EDMUND B., Feb. 23, 1918. A. E. F., June 5, 1918-. F. A.; Co. C, 311th Inf., 78th Div.

HOLMES, ROBERT P., May 15, 1917. A. E. F., Oct. 1, 1917, to April 5, 1919. Co. G, 103d Inf., 26th Div. Apremont, Château-Thierry, Xivray. Discharged April 28, 1919.

HOWARD, ARTHUR M., Sept. 22, 1917. A. E. F., July 6, 1918, to July 11, 1919. 301st and 116th Ammunition Train, Inf. Discharged July 19, 1919.

HOWE, ALBERT E., May 12, 1917. U. S. N. R. F. Convoy duty. Discharged Jan. 11, 1919.

HOWE, GEORGE C., Sept. 18, 1917. A. E. F., May 16, 1918, to July 18, 1919. Co. L, 328th Inf., 82d Div.; 20th F. A.,

## M. A. C. IN THE WAR

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5th Div.; 15th F. A., 2d Div. Meuse-Argonne. Army of Occupation. Discharged Aug. 25, 1919.

HUNNEWELL, PAUL F., Jan. 5, 1918. A. E. F., April 6, 1918, to July 29, 1919. Co. B, 307th Inf., 77th Div.; M. G. Co., 131st Inf., 33d Div.; Co. H, 131st Inf., 33d Div.; Co. E, 129th Inf., 33d Div. Verdun, St. Mihiel, Meuse-Argonne. Discharged Aug. 13, 1919.

HUNTOON, DOUGLAS H., Inf.; Tank Corps. Sept. 20, 1917, to Dec. 24, 1918.

HURLBURT, R. WALTER, May 15, 1918. A. E. F., Oct. 6 to Dec. 24, 1918. Bat. C, 137th F. A., 38th Div. Discharged Jan. 17, 1919.

INGALLS, IRVING W., U. S. N. R. F. June 6, 1918, to Jan. 3, 1919.

IRVINE, ROBERT P. Died of disease Jan. 16, 1919. (See page 58.)

JACKSON, CHARLES H., May 18, 1917. A. E. F., Sept. 25, 1917 to April 4, 1919. 101st Engrs., 26th Div. Chemin-des-Dames, Toul, St. Mihiel, Meuse-Argonne, Champagne-Marne, Aisne-Marne, Xivray, Troyon. Discharged April 28, 1919.

JOHNSON, BIRGER L., Chemical Warfare Service. July 22, 1918, to Dec. 24, 1918.

JONES, FORREST D. Killed April 16, 1918. (See page 58.)

JONES, LEON D., May 23, 1916. A. E. F., Oct. 1, 1917, to April 1, 1919. Co. C, 104th Inf., 26th Div. Chemin-des-Dames, Toul, Marne, St. Mihiel. Wounded July 19, 1918, and Sept. 22, 1918. Discharged April 28, 1919.

KENNEDY, CARL F., Air Service. Oct. 27, 1917-.

KIRKHAM, PHILIP L., San. Corps, Med. Dept.; Gas defence, Chemical Warfare Service. July 5, 1917, to April 1, 1919.

LANPHEAR, MARSHALL O., Inf. May 16 to Dec. 11, 1918.

LASKER, DAVID, S. A. T. C. Oct. 10 to Dec. 12, 1918.

## M. A. C. IN THE WAR

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- LAWRENCE, LEWIS H., Engrs. Sept. 5, 1918, to Jan. 2, 1919.
- LEONARD, RALPH S., Inf. Sept. 2, 1918, to Jan. 16, 1919.
- LORING, WILLIAM R., Dec. 13, 1917. A. E. F., April 7, 1918, to July 2, 1919. Inf.; Co. 26, 20th Engrs. Discharged July 10, 1919.
- LYONS, LOUIS M., Inf. May 15 to Dec. 15, 1918.
- MAGINNIS, JOHN J., Aug. 27, 1917. A. E. F., July 5, 1918, to Aug. 4, 1919. 301st Inf., 76th Div.; 163d Inf., 41st Div.; Prisoner of War Escort Co. No. 228. Discharged Aug. 26, 1919.
- MALLOREY, ALFRED S., Inf.; O. T. S. Sept. 9 to Nov. 23, 1918.
- MARSHALL, MAX S., Inf. May 12, 1917-.
- MCCLELLAN, ADAMS N., Jan. 5, 1918. A. E. F., May 2, 1918, to May 13, 1919. Hdqrs. Co., 306th F. A., 77th Div.; Supply Co., 310th F. A., 79th Div. Discharged June 3, 1919.
- McKECHNIE, DONALD, Inf.; F. A. Sept. 21, 1917, to Feb. 20, 1919.
- McNAUGHT, WARREN H., June 7, 1917. A. E. F., May 29, 1918, to July 29, 1919. 77th F. A., 4th Div. Meuse-Argonne. Army of Occupation. Still in service.
- MINOR, JOHN B., Jr., Nov. 26, 1917. A. E. F., April 16, 1918, to July 11, 1919. 61st Inf. St. Mihiel, Meuse-Argonne. Wounded Oct. 15, 1918. Discharged July 19, 1919.
- MITCHELL, EDWARD N., May 14, 1917. A. E. F., Sept. 7, 1917, to Feb. 14, 1919, and Oct. 18 to Nov. 9, 1919. 9th Inf. St. Mihiel, Château-Thierry, Soissons, Pont-a-Mousson, Vaux. Discharged Nov. 12, 1919.
- MITCHELL, THEODORE B., Oct. 5, 1917. A. E. F., July 12, 1918, to May 7, 1919. Band, Hdqrs. Co., 327th Inf.; Co. I, 302d Inf.; Hdqrs. Co., 302d Inf. Discharged May 28, 1919.
- MOWER, CARLOS T., Inf. May 16, 1918, to Feb. 6, 1919.

## M. A. C. IN THE WAR

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MOYNIHAN, PATRICK J., Inf. Aug. 27, 1917, to March 25, 1919.

NORCROSS, GARDNER C., Inf. Oct. 6, 1917, to Dec. 23, 1918.

ODAMS, LESTER N., May 14, 1917. A. E. F., July 8, 1918, to Aug. 4, 1919. 303d M. G. Bn., 76th Div.; 148th M. G. Bn., 41st Div. Discharged Aug. 27, 1919.

PATCH, LAWRENCE H., Hospital, U. S. N. R. F. July 7, 1917, to April 8, 1919.

PETIT, ARTHUR V. Died of disease Jan. 8, 1919. (See page 60.)

PHIPPS, CLARENCE R., Air Service. Jan. 28 to Dec. 19, 1918.

POPP, EDWARD W., May 7, 1918. A. E. F., Sept. 12, 1918, to Aug. 25, 1919. Co. C, 5th Field Bn., Sig. Corps, 3d Div. Discharged Aug. 29, 1919.

POWELL, JAMES C., Inf. May 15, 1917, to Dec. 13, 1918.

PRATT, OLIVER G., Inf. May 16 to Dec. 28, 1918.

PREBLE, JOHN N., December, 1917. A. E. F., Jan. 9, 1918, to May 28, 1919. Ambulance Service, S. S. U. No. 598, with French Army. Verdun, St. Quentin, Champagne, La Capelle. Discharged May 31, 1919.

RANDALL, WARING E., Engrs. June 2, 1918, to Jan. 31, 1919.

RAYMOND, CLINTON R., Nov. 14, 1917. A. E. F., Dec. 26, 1917, to Feb. 1, 1919. 1st Gas Regt., 30th Engrs. British offensive in Flanders, Fay-en-Haye, Leringes, St. Thibart, Vesle, Meuse-Argonne. Discharged Feb. 15, 1919.

REUMANN, THEODORE H., Inf. Jan. 5 to Dec. 12, 1918.

RICHARDSON, STEPHEN M., Jan. 5, 1918. A. E. F., April 7, 1918, to July 5, 1919. Co. I, 308th Inf., 77th Div.; Co. G, 9th Inf., 2d Div.; Co. A, 340th Inf., 85th Div. Baccarat, Pont-a-Mousson, Champagne, Blanc Mont Ridge, Meuse-Argonne. Discharged July 10, 1919.

RITTER, ERNEST, Inf. July 25 to Dec. 12, 1918.

## M. A. C. IN THE WAR

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- ROBINSON, WILLIAM H., Dec. 9, 1917. A. E. F., April 19 to Dec. 16, 1918. 1st Gas Regt. St. Mihiel. Discharged Jan. 16, 1919.
- ROSEQUIST, BIRGER R., Jan. 5, 1918. A. E. F., Sept. 14, 1918, to August, 1919. 331st Inf., 83d Div. Discharged July 31, 1919.
- SAMPSON, FREDERICK B., May 11, 1917. A. E. F., July 5, 1918, to Oct. 15, 1919. 163d and 303d Inf.; Prisoner of War Escort Co. No. 226. Discharged Oct. 23, 1919.
- SANBORN, DEAN W., Dec. 6, 1917. A. E. F., March 25, 1918, to Jan. 22, 1919. Bat. C, 55th C. A. C. Marne, Vesle, Meuse-Argonne. Discharged Feb. 5, 1919.
- SAWYER, WESLEY S., Jan. 5, 1918. A. E. F., April 22, 1918, to June 30, 1919. 306th Inf., 77th Div.; 131st Inf., 33d Div. Somme, Meuse-Argonne, Verdun, St. Mihiel. Army of Occupation. Discharged Aug. 5, 1919.
- SAWYER, WILLIAM G., Air Service. Dec. 18, 1917, to Dec. 18, 1918.
- SCHLOUGH, GEORGE H., March 28, 1918. A. E. F., June 28, 1918, to Jan. 24, 1919. 44th Engrs. St. Mihiel, Meuse-Argonne. Discharged Feb. 12, 1919.
- SEAVEY, ARTHUR J., May 31, 1917. U. S. N. R. F. Sea Service, Oct. 21, 1918, to Feb. 20, 1919, U. S. S. "Com-  
fort." Discharged Aug. 18, 1919.
- SEAVEY, MARDEN H., Oct. 5, 1917. A. E. F., July 31, 1918-. 301st Ammunition Train, Inf., 76th Div.; 116th Ammu-  
nition Train, 42d Div.
- SMITH, CARLETON T., Med. Corps, Chemical Warfare Service. May 21 to Dec. 18, 1918.
- SMITH, SIDNEY S., May 1, 1918. A. E. F., Aug. 3, 1918, to March 6, 1919. 76th Div., 59th C. A. C. Argonne. Dis-  
charged March 21, 1919.
- SPAULDING, LEWIS W., May 14, 1917. A. E. F., Jan. 1, 1918, to June 28, 1919. 18th Inf., 1st Div. Cantigny, Soissons, Argonne. Wounded. Discharged July 9, 1919.

## M. A. C. IN THE WAR

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STACKPOLE, FRANK C., Air Service. Sept. 29, 1917, to Jan. 10, 1919.

STANTON, FRANK P., Inf. Nov. 8, 1918-.

STOWE, RAYMOND T., Sept. 20, 1917. A. E. F., July 8, 1918, to July 18, 1919. Co. A, 303d M. G. Bn., 76th Div.; Co. A, 148th M. G. Bn., 41st Div. Discharged July 24, 1919.

STOWERS, ADDISON C., F. A. Aug. 28, 1918, to Jan. 10, 1919.

SWIFT, HUBBARD, Sept. 19, 1917. A. E. F., July 5, 1918; to Sept. 21, 1919. Co. H, 302d Inf., 76th Div.; Prisoner of War Escort Co. No. 231. Discharged Sept. 25, 1919.

SWIFT, RAYMOND W., June 1, 1917. A. E. F., Sept. 27, 1917, to April 4, 1919. Band, 104th Inf., 26th Div. Chemin-des-Dames, Toul, Apremont, Château-Thierry, St. Mihiel, Meuse-Argonne, Aisne-Marne. Discharged April 28, 1919.

THAYER, WESTON C., Med. Corps. Aug. 22, 1918, to Aug. 11, 1919.

THOMPSON, WELLS N., Inf. Sept. 6, 1917, to Dec. 10, 1918.

THORPE, RICHARD W., Radio School. U. S. N. R. F. Sept. 24, 1917, to Feb. 8, 1919.

TILTON, ARTHUR D., Inf.; F. A. June 26 to Dec. 8, 1918.

UNDERWOOD, ARTHUR L., May, 1918. A. E. F., August, 1918, to July 1, 1919. Co. M, 1st Ammunition Train; Q. M. C. Gassed at Fismes Oct. 25, 1918. Army of Occupation. Discharged July 8, 1919.

WEEKS, ROGER W., Inf. May 12, 1917, to Feb. 5, 1919.

WILBUR, LAWRENCE W., May 18, 1917. U. S. N. R. F. A. E. F., Transport and Supply Ship Service, Aug. 21, 1918, to Jan. 23, 1919. Discharged March 28, 1919.

WILLOUGHBY, RAYMOND R., Inf. Oct. 6, 1917, to Feb. 8, 1919.

WOLFSON, LOUIS E., Med. Corps. May 14 to Dec. 21, 1918.

WOODING, PAUL B., C. A. C. Oct. 22 to Nov. 18, 1918.



## M. A. C. IN THE WAR

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- WOODS, FRANK A., July 5, 1917. A. E. F., Sept. 9, 1917, to April 10, 1919. Hdqrs. Co., 101st F. A., 26th Div. Verdun, Château-Thierry, St. Mihiel, Chemin-des-Dames, Meuse-Argonne. Wounded. Discharged April 29, 1919.
- WOODWORTH, BROOKS. Died of disease Oct. 21, 1918. (See page 63.)
- WORTHLEY, HARLAN N., Aug. 27, 1917. A. E. F., Jan. 15, 1918, to March 30, 1919. 166th Inf., 42d Div. Champagne, Marne, Soissons-Rheims, St. Mihiel, Luneville, Baccarat, Meuse-Argonne. Discharged April 9, 1919.
- WRIGHT, JOHN L., Dec. 1, 1917. A. E. F., April 2, 1918, to Jan. 22, 1919. Bat. E, 55th C. A. C. Marne, Vesle, Meuse-Argonne. Discharged Feb. 5, 1919.

### CLASS OF 1919

- ALDEN, DEAN W., U. S. N. R. F., Dec. 20, 1917. Transport Service, U. S. S. "George Washington," March 25, 1918, to Oct. 14, 1919. Discharged Oct. 27, 1919.
- ANDERSON, GEORGE W., U. S. N. R. F. July 16 to Dec. 24, 1918.
- BAGG, QUINCY A., Inf.; O. T. S. Oct. 10 to Nov. 23, 1918.
- BAKER, WILLIAM H., Jr., Inf.; Tank Corps. Aug. 28 to Dec. 14, 1918.
- BARTLETT, SAMUEL C., Jr., June 20, 1917. A. E. F., Oct. 20, 1917, to April 10, 1919. Bat. C, 103d F. A., 26th Div. Chemin-des-Dames, Toul, Xivray, Château-Thierry, Verdun, Argonne. Wounded at Château-Thierry. Discharged April 29, 1919.
- BATCHELDER, STEWART P., Marine Corps. Aug. 8, 1918, to Feb. 18, 1919.
- BAXTER, HERBERT H., Inf. Sept. 22, 1917, to Dec. 6, 1918.
- BEADLE, HERBERT O., Sept. 8, 1917. A. E. F., May 26, 1918, to May 14, 1919. 307th F. A. Toul, St. Mihiel. Discharged May 16, 1919.

## M. A. C. IN THE WAR

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- BIGELOW, GEORGE S., July 24, 1917. A. E. F., June, 1918, to May 11, 1919. Med. Dept., 104th Engrs., 29th Div. Belfort, Meuse-Argonne. Discharged May 29, 1919.
- BLANCHARD, CARLTON D., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- BLANCHARD, GEORGE K., Nov. 17, 1917. A. E. F., Sept. 28, 1918, to May 28, 1919. 28th Aero Squad. Discharged June 2, 1919.
- BOGHOLT, CARL M., Inf. July 29, 1918, to Jan. 15, 1919.
- BOLAND, KELLS S., Aug. 28, 1917. A. E. F., Sept. 25, 1917, to April 4, 1919. Band, 101st Engrs., 26th Div. Chemin-des-Dames, Soissons, Toul, Château-Thierry, Verdun. Discharged April 28, 1919.
- BOND, HERBERT R., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- BOWEN, ARTHUR N., F. A. June 13, 1918, to Jan. 5, 1919.
- BOYCE, ALAN F., Inf. Oct. 10, 1918, to Jan. 15, 1919.
- BOYNTON, RAYMOND W., Jan. 5, 1918. A. E. F., April 6, 1918, to July 31, 1919. 132d Inf., 33d Div. Somme, Meuse-Argonne. Discharged Aug. 16, 1919.
- BRADLEY, WILLIAM G., Nov. 12, 1917. Air Service. Wounded in airplane crash April 15, 1918. Discharged Jan. 7, 1919.
- BURT, HENRY J., O. T. S. Oct. 21 to Dec. 5, 1918.
- BURTON, LEE W., Air Service. June 1 to Dec. 4, 1918.
- CALLANAN, JOHN E., F. A. Aug. 27 to Dec. 11, 1918.
- CALLANAN, VINCENT D., Inf. Aug. 14 to Nov. 30, 1918.
- CAMPBELL, DONALD L., May, 1917. A. E. F., June 23, 1917, to Oct. 26, 1918. Italian Ambulance Unit Sect. II. Honorary Lieutenant, Italian Army. Verdun, Piave River. Gassed at Verdun. Citations: Italian War Cross, July, 1918. Discharged Oct. 26, 1918.
- CARPENTER, HALL B., Inf. June 3 to Dec. 21, 1918.
- CASSIDY, MORTON H., Air Service. Jan. 24 to Dec. 21, 1918.
- CASTLE, GEORGE B., U. S. N. R. F. Dec. 3, 1917-.

## M. A. C. IN THE WAR

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- CHANDLER, ARTHUR L., Naval Aviation. Oct. 11 to Nov. 18, 1918.
- CHAPIN, FREDERIC C., Feb. 25, 1918. A. E. F., April 6, 1918, to April 19, 1919. Hdqrs. Co., 308th Inf., 77th Div. Baccarat, Château-Thierry, Vesle, Aisne, Argonne. Discharged May 9, 1919.
- CHASE, CHESTER I., Air Service. Dec. 31, 1917, to Nov. 27, 1918.
- CHASE, MALCOLM W., U. S. N. R. F. June 1, 1918, to Jan. 13, 1919.
- CHISHOLM, ROBERT D., Inf.; O. T. S. Oct. 10 to Dec. 17, 1918.
- CLAPP, A. WARREN, July 27, 1917. U. S. N. R. F. Ocean Patrol Submarine between Bermuda and Azore Islands, Oct. 15 to Nov. 20, 1918. Discharged Feb. 27, 1919.
- CODERRE, ERNEST L., Inf. May 15, 1918, to date.
- COE, ELMORE H., Inf. Aug. 29, 1918, to Feb. 3, 1919.
- COLLINS, ROBERT B., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- COOLEY, EDWIN P. Killed in action Aug. 27, 1918. (See page 51.)
- COSBY, ALFRED F., Quartermaster Reserve Corps.
- CROWE, CHARLES, Med. Dept. Aug. 26, 1918, to Aug. 10, 1919.
- DAVIES, JAMES P., July 31, 1917. A. E. F., Aug. 16, 1918, to May 6, 1919. Co. A, 113 Field Sig. Bn. St. Mihiel, Argonne. Discharged May 19, 1919.
- DAVIS, ALBERT N., Air Service. Jan. 22 to Dec. 16, 1918.
- DAY, ELSTON A. Died of disease Sept. 26, 1918. (See page 53.)
- DAY, HAROLD R., Jan. 5, 1918. A. E. F., April 6, 1918-. Co. H, 308th Inf., 77th Div.; Prisoner of War Escort Co. No. 33. Lorraine, Baccarat, Calais. Discharged Oct. 2, 1919.

## M. A. C. IN THE WAR

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DESMOND, THOMAS W. Killed in action May 27, 1918. (See page 53.)

DICKINSON, VICTOR A., Inf. June 3, 1918, to Jan. 3, 1919.

DUNBAR, CHARLES O., U. S. N. R. F., Dec. 10, 1917. Sea Service, Aug. 15, 1918, to Jan. 20, 1919. Discharged Aug. 14, 1919.

DUNN, LESLIE B., 5th Cavalry; M. T. C. May 1, 1918-. Still in service.

EDMONDS, REGINALD W., Naval Aviation. Dec. 1, 1917, to Jan. 31, 1919.

EILERTSON, ARTHUR O., May 28, 1918. A. E. F., Oct. 15 to Dec. 15, 1918. Radio Operator, Hdqrs. Co., 117th F. A. Discharged Jan. 15, 1919.

ERICKSON, GUNNAR E., S. A. T. C. Oct. 10 to Dec. 16, 1918.

EVANS, MYRTON F., S. A. T. C. Oct. 10 to Dec. 19, 1918.

FANEUF, AMBROSE C., Inf. Oct. 10 to Nov. 18, 1918.

FARRINGTON, ROBERT P. May 15 to Dec. 16, 1918.

FAXON, PAUL, Inf. Oct. 10, 1918, to Jan. 15, 1919.

FERRISS, SAMUEL B., F. A. Oct. 22 to Dec. 18, 1918.

FIELD, JOHN B., Sept. 17, 1917. A. E. F., Oct. 28 to Dec. 20, 1918. Air Service. Discharged Jan. 19, 1919.

FOGG, VERNE A., Inf., O. T. S. Sept. 9 to Nov. 23, 1918.

FRENCH, WILLARD K., S. A. T. C. July 26 to Dec. 5, 1918.

GARDE, EARL A., Inf. Aug. 8 to Dec. 9, 1918.

GAY, LAURENCE W. Died from wounds Oct. 30, 1918. (See page 55.)

GILLIGAN, GERALD M., Nov. 22, 1917. A. E. F., Jan. 10, 1918, to Oct. 15, 1919. Inf.; 12th F. A., 41st Div.; Q. M. C. Discharged Oct. 29, 1919.

GLAVIN, WILLIAM M., Marine Corps. May 24, 1918, to Feb. 8, 1919.

GOFF, HOWARD M., Instructor Harvard Radio School. December, 1917, to April 4, 1919.

## M. A. C. IN THE WAR

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- GRAVES, WALTER D., Ord. Dept. July 1, 1918, to Jan. 15, 1919.
- GRAY, HAROLD F., April 23, 1917. A. E. F., Oct. 10, 1917, to April 17, 1919. Co. D, M. G. Bn., Inf., 26th Div. Xivray, Aisne-Marne, St. Mihiel, Meuse-Argonne. Gassed. Discharged April 29, 1919.
- GUBA, EMIL F., Quartermaster Reserve Corps. Aug. 20, 1918, to Jan. 5, 1919.
- GURSHIN, MELVIN W., Dec. 5, 1917. A. E. F., Jan. 29, 1918, to March, 1919. Q. M. C.; M. T. C. Argonne. Wounds: compound fracture by shrapnel. Discharged March 21, 1919.
- HALL, FRANK E., Dec. 14, 1917. U. S. N. R. F. Sea Service, Oct. 1, 1918, to Dec. 15, 1919. Discharged Dec. 29, 1919.
- HARDING, GEORGE W., May 15, 1917. U. S. N. R. F. Transport Service. Still in service.
- HATHAWAY, WILFRED A., U. S. N. R. F. March 30 to Dec. 30, 1918.
- HAYES, JOHN A., S. A. T. C. Oct. 14 to Dec. 17, 1918.
- HOPKINS, GEORGE R. Oct. 5 to Dec. 23, 1918.
- HUNTER, HAROLD, Jan. 5, 1918. A. E. F., April 16, 1918, to April 19, 1919. Inf., 77th Div. Meuse-Argonne. Cited for faithful and conscientious duty during Meuse-Argonne operation. Discharged May 10, 1919.
- JEWELL, CHARLES H., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- JOHNSON, LAWRENCE W., Air Service. Jan. 4 to Nov. 25, 1918.
- JOHNSON, SIDNEY C., F. A. Aug. 6, 1918, to Feb. 3, 1919.
- JORDAN, RAYMOND D., Naval Aviation. Dec. 11, 1917, to April 3, 1919.
- KENNEDY, ALAN C., May 1, 1918. A. E. F., July 4, 1918, to August, 1919. Co. C, 303d Inf., 76th Div.

## M. A. C. IN THE WAR

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- KIMBALL, WILLIAM L., May 21, 1917. U. S. N. R. F. Transport Service, Feb. 6, 1918, to June, 1919. Discharged July 1, 1919.
- KNIGHT, FRANK E., Dec. 7, 1917. U. S. N. R. F. Transport Service, U. S. S. "Mt. Vernon," March 15 to August, 1919. Discharged Sept. 5, 1919.
- KOLPACK, HARRY W., C. A. C. October, 1918-.
- LEARY, FRANK D., July 11, 1917. U. S. N. R. F. Transport Service, April 14 to Sept. 16, 1919. Discharged Oct. 16, 1919.
- LEIPER, MCCARRELL H., Feb. 25, 1918. A. E. F., April 9, 1918, to Feb. 12, 1919. Co. A, 307th Inf., 77th Div. Château-Thierry, Meuse-Argonne. Wounded by shrapnel Oct. 28, 1918. Still in service.
- MACDONALD, HAROLD R., Air Service. Dec. 15, 1917, to Dec. 24, 1918.
- MAHON, JOHN J., Sig. Corps; Air Service. Aug. 31, 1917, to Dec. 9, 1918.
- MANSELL, ELTON J., Jan. 5, 1918. A. E. F., April 5, 1918, to May 22, 1919. Co. D, 307th Inf., 77th Div.; 129th and 131st Inf. Somme, Meuse-Argonne. Discharged June 16, 1919.
- MARTIN, ANDREW L., Feb. 19, 1918. U. S. N. R. F. Transport Service, July 10 to Oct. 20, 1918. Discharged June 2, 1919.
- MARTIN, CHESTER W., U. S. N. R. F. May 3, 1918, to July 22, 1919.
- MATHER, WILLIAM, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- MATTOON, CHARLES G., F. A. Sept. 7 to Dec. 18, 1918.
- MCCARTHY, ARTHUR M., Marine Corps. July 14, 1918, to Jan. 14, 1919.
- MONTGOMERY, ARTHUR B., Engrs. July 25 to Sept. 1, 1917.
- MOORE, JOHN R. Killed in action Oct. 16, 1918. (See page 60.)

## M. A. C. IN THE WAR

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- MORGAN, EARL A., July 4, 1917. A. E. F., April 7, 1918, to July 21, 1919. Co. H, 38th Inf., 3d Div.; Co. A, 322d Inf., 81st Div. Champagne-Marne, Aisne-Marne, Meuse-Argonne. Discharged Aug. 16, 1919.
- MORSE, LOUIS E., Jr., April 12, 1917. U. S. N. R. F. Submarine Patrol, March 31, 1918, to June 10, 1919. Discharged June 13, 1919.
- MORSE, MAURICE, Nov. 26, 1917. 33d Inf. Panama and Canal Zone, April 15, 1918, to March, 1919. Discharged May 26, 1919.
- MORTON, ELMER J., C. A. C. Oct. 22 to Dec. 23, 1918.
- NEWBOLD, DOUGLAS T., Jan. 5, 1918. A. E. F., April 20, 1918, to May 14, 1919. Hdqrs. Co., 306th F. A., 77th Div.; 341st F. A.; Bat. A, 308th F. A., 78th Div. Argonne, Grand Pré, St. Mihiel, Meuse-Argonne, Sedan. Discharged May 17, 1919.
- NEWTON, ADELBERT, Dec. 4, 1917. U. S. N. R. F. Convoy duty, U. S. S. "Des Moines," Jan. 17 to Sept. 4, 1918. Discharged Dec. 30, 1918.
- NEWTON, EDWARD B., Sept. 21, 1917. A. E. F., Dec. 10, 1917, to May 28, 1919. Co. C, 504th Engrs. Discharged June 16, 1919.
- O'HARA, JOSEPH E., Jan. 5, 1918. A. E. F., April 6, 1918, to June 1, 1919. 306th and 308th Inf., Co. I, 318th Inf. Citation for engagement of Sept. 27, 1918. Discharged June 8, 1919.
- O'HERON, FRANK, Air Service.
- O'KEEFFE, JOHN P., Oct. 7, 1917. A. E. F., May 1, 1918, to May 1, 1919. Co. H, 328th Inf. Toul, Marbache sector, St. Mihiel, Meuse-Argonne. Discharged June 2, 1919.
- PARKE, ROBERT W., F. A. July 4 to Dec. 14, 1918.
- PARSONS, EDWARD F., S. A. T. C. Oct. 20 to Dec. 13, 1918.
- PECK, GEORGE M., C. A. C. Oct. 20 to Dec. 30, 1918.

## M. A. C. IN THE WAR

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- PECK, ROGER E., Aug. 14, 1917. A. E. F., Jan. 24 to Dec. 5, 1918. Air Service. Discharged Dec. 18, 1918.
- PERRY, ERROL C., F. A. Aug. 26, 1918, to Feb. 1, 1919.
- PETERSON, ROY D., Dec. 27, 1917. U. S. N. R. F. Transport Service, July 13, 1918, to March 4, 1919. Discharged March 4, 1919.
- PHEMISTER, ROBERT G., Ord. Dept.; Chemical Warfare Service. Feb. 28 to Dec. 14, 1918.
- PIERPONT, FREDERICK T., Sig. Corps. Aug. 15 to Dec. 17, 1918.
- POND, ALLAN L., July 26, 1917. A. E. F., July 27, 1917, to Jan. 5, 1919. 14th Ry. Engrs. Arras-Cambrai, Fismes, Château-Thierry. Discharged Jan. 30, 1919.
- POOLE, HAROLD W., Air Service. Nov. 15, 1917, to Aug. 5, 1919.
- PREE, KARL J., C. A. C. Nov. 11, 1918, to March 11, 1919.
- QUIMBY, ARTHUR E., September, 1917. A. E. F., April 18, 1918-. 301st, 303d and 134th F. A. Meuse-Argonne.
- RAPHAEL, CHARILAUS G. C., S. A. T. C. Oct. 1 to Dec. 12, 1918.
- RATNER, CHARLES C., U. S. N. R. F.
- READIO, ROGER F., Air Service. Dec. 15, 1917, to Aug. 19, 1919.
- RECORD, HAROLD J., Air Service. March 16, 1918, to Jan. 7, 1919.
- RICE, HAROLD M., Inf.; Sig. Corps. Nov. 27, 1917, to March 31, 1919.
- ROBERTS, MARK A., Oct. 4, 1917. A. E. F., May 1 to Dec. 28, 1918. Co. E, 310th Inf.; Co. D, 328th Inf.; Cos. D and E, 9th Inf. Pont-a-Mousson, St. Mihiel, Meuse-Argonne. Discharged Jan. 29, 1919.
- ROSS, DONALD, Air Service. April 15 to Nov. 30, 1918. Injured Nov. 5, 1918.



## M. A. C. IN THE WAR

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- ROWE, CLIFFORD A., Jan. 5, 1918. A. E. F., April 15, 1918-. Co. H, 305th Inf., 77th Div.; Co. H, 110th Inf., 28th Div. Vesle, Argonne, Apremont, Château-Thierry. Army of Occupation. Discharged May 18, 1919.
- RYDER, HAROLD W., Oct. 6, 1917. A. E. F., June, 1918, to May 6, 1919. 307th Ammunition Train, 157th Art. Brig., 82d Div. St. Mihiel, Meuse-Argonne. Discharged May 22, 1919.
- SARGENT, WALTER H., Nov. 17, 1917. A. E. F., Sept. 3, 1918-. Air Service. Discharged Feb. 10, 1919.
- SCHENKELBERGER, FREDERIC, April 10, 1917. A. E. F., Oct. 5, 1917, to July 3, 1919. 302d F. A.; Balloon Co. No. 67, 4th French Army. Seicheprey. Discharged July 3, 1919.
- SEAVEY, PAUL S., Oct. 5, 1917. A. E. F., Aug. 25, 1918, to Jan. 2, 1919. U. S. N. R. F. Discharged Jan. 15, 1919.
- SEDGWICK, ALFRED, Air Service. May 14, 1917, to Dec. 13, 1918.
- SEXTON, ERNEST F. Killed in action June 4, 1918. (See page 61.)
- SKINNER, EVERETT H., Jan. 5, 1918. A. E. F., April 5 to Nov. 17, 1918. Co. D, 307th Inf.; Co. D, 132d Inf. Albert-Amiens, Meuse-Argonne. Wounded October 9. Discharged April 5, 1919.
- SMALLWOOD, JOHN H., June 24, 1918. A. E. F., Aug. 24, 1918-. Hospital Corps, Med. Dept., 87th Div. St. Mihiel.
- SMITH, JONATHAN H., Feb. 25, 1918. A. E. F., July 6, 1918, to June 1, 1919. Inf. Discharged June 5, 1919.
- SMITH, WENDELL F., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- SPAULDING, HAROLD E., Inf. July 6, 1918, to Jan. 30, 1919.
- SPENCER, ARTHUR W., Inf. Oct. 5, 1917, to Dec. 31, 1918.
- SPROUL, WALTON D., July 7, 1917. A. E. F., July 7, 1917, to April 2, 1919. American Field Service, Ambulance Sect. No. 641.

## M. A. C. IN THE WAR

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- STAFFORD, IRVING B., O. T. S. Oct. 10 to Nov. 23, 1918.
- STOCKWELL, E. SIDNEY, Jr., O. T. S.; Inf. July 5 to Nov. 23, 1918.
- STRACK, EDWARD, Inf.; F. A. July 15 to Dec. 28, 1918.
- STUART, VINCENT C., May, 1917. A. E. F., Sept. 7, 1917, to April, 1919. 101st F. A., 26th Div. Chemin-des-Dames, Toul, Château-Thierry, Marne, St. Mihiel, Verdun, Xivray. Discharged April 29, 1919.
- SUTHERLAND, RALPH, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- SWEENEY, WILLIAM J., Inf. Oct. 1, 1918, to Jan. 15, 1919.
- THAYER, JULIAN B., U. S. N. R. F. June 2, 1918-.
- THOMAS, DANIEL J., Q. M. C.; Inf. Feb. 8, 1917, to Nov. 23, 1918.
- TIRRELL, LORING V., Inf. July 5, 1918, to Oct. 29, 1919.
- VICKERS, JOHN. Aug. 5 to Aug. 10, 1918.
- WAITE, RICHARD A., May 8, 1918. A. E. F., Sept. 23, 1918, to March 7, 1919. C. A. C. Discharged March 13, 1919.
- WHITE, GEORGE L., S. N. T. C. March 19 to Dec. 20, 1918.
- WHITTLE, CLARENCE P., Jr., April 18, 1918. A. E. F., July to Dec. 6, 1918. Air Squad. B, Marine Corps.
- WINDOW, THOMAS, Air Service.
- WOODSIDE, WILFRED L. Killed Oct. 14, 1918. (See page 63.)
- WRIGHT, LIVINGSTON, French Army, July 16 to September, 1917. U. S. Army, Sept. 1, 1917. A. E. F., July 16, 1917, to May 28, 1919. Ambulance Sect. No. 641, 17th and 158th French Divs., July to September, 1917. U. S. Army, Ambulance Sect. No. 649, 1st Div.; 116th Engrs. St. Mihiel, Verdun, Somme, Meuse-Argonne. Discharged June 5, 1919.
- YESSAIR, JOHN, Quartermaster Reserve Corps.

## M. A. C. IN THE WAR

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### CLASS OF 1920

- ALLEN, HAROLD K., Naval Aviation. Sept. 22 to Dec. 2, 1918.
- ANDREWS, GEORGE H., Jan. 3, 1918. A. E. F., July 18, 1918, to April 29, 1919. Evacuation Ambulance Co. No. 6. Aisne-Marne, Château-Thierry, St. Mihiel, Meuse-Argonne. Army of Occupation. Discharged May 21, 1919.
- APSEY, GEORGE W., Jr., Inf.; O. T. S. Oct. 10 to Nov. 21, 1918.
- ARMSTRONG, PHILIP B., Inf. Oct. 10, 1918, to Feb. 15, 1919.
- BABCOCK, LESLIE E., Inf. July 22, 1918, to May 28, 1919.
- BACON, MILO R., Inf.; O. T. S. Oct. 10 to Nov. 25, 1918.
- BALL, HARRY A., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- BALL, LORIN E., Inf.; O. T. S. Oct. 10 to Dec. 3, 1918.
- BEAUREGARD, WINFIELD S., U. S. N. R. F. July 10 to Dec. 21, 1918.
- BERMAN, HARRY, Inf. July 15 to July 22, 1918.
- BIGELOW, HENRY C., Inf. Oct. 10, 1918, to Jan. 16, 1919.
- BLANCHARD, KENNETH, C. A. C. Aug. 10 to Dec. 7, 1918.
- BOWMAR, RALPH B., May 10, 1917. A. E. F., Aug. 7, 1917, to Sept. 4, 1919. Med. Dept., 1st Engrs., 1st Div. Soissons, St. Mihiel, Argonne, Pont-a-Mousson. Cited for distinguished conduct near Yoncq, Nov. 6, 1918. Discharged Sept. 26, 1919.
- BRIDGE, JAMES P., Corps of Intelligence Police, General Staff. June 29, 1918-.
- BROWN, ROY R., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- BUNKER, CARROLL W., Inf.; O. T. S. Oct. 10 to Nov. 24, 1918.
- BURNETT, PAUL L., June 12, 1917. A. E. F., March 25, 1918, to May 25, 1919. Med. Dept., 55th C. A. C. Aisne-Marne, Meuse-Argonne, Oise-Aisne. Gassed. Discharged July 10, 1919.

## M. A. C. IN THE WAR

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- BURNS, A. M., Jr., C. A. C. July 31 to Nov. 23, 1918.
- CAMPBELL, GEORGE M., S. A. T. C. Amer. Ry. Engrs. Oct. 7 to Nov. 16, 1918.
- CANDE, ROBERT P., Jan. 5, 1918. A. E. F., April 19, 1918, to June 11, 1919. Co. A, 308th Inf., 77th Div.; Co. E, 23d Inf., 2d Div. St. Mihiel, Champagne, Blanc Mont Ridge, Meuse-Argonne. Army of Occupation. Awarded Croix de Guerre for action, Oct. 3 to 9, 1918. Discharged June 13, 1919.
- CARD, RALPH H., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- CARLETON, JOHN F., Inf.; O. T. S. Oct. 10 to Nov. 23, 1918.
- CENTER, ARTHUR E., Inf.; O. T. S. Oct. 10 to Dec. 2, 1918.
- CHASE, FRANCIS C., New England Sawmill Unit in England, June 15, 1917, to Jan. 15, 1918. Jan. 21, 1918, Co. F, 163d Inf., 41st Div. A. E. F., Jan. 21, 1918, to July 20, 1919. Discharged July 25, 1919.
- CLARRIDGE, FRED W., U. S. N. R. F. July 9, 1918, to Jan. 9, 1919.
- CLOUGH, ALFRED A., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- COLE, FRED E., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- CRAFTS, GORDON B., Engrs. Sept. 1 to Dec. 3, 1918.
- CRAWFORD, ALEXANDER G., June 11, 1917. A. E. F., July 9, 1917, to April 20, 1919. Med. Corps, Base Hospital No. 5. Discharged May 2, 1919.
- CRAWFORD, JOHN A., Inf. Oct. 10, 1918, to Jan. 15, 1919.
- CRIMMIN, ROYCE B., Air Service. Jan. 8, 1918, to May 29, 1919.
- DAGGETT, CLINTON J., Inf. July 22 to Dec. 23, 1918.
- DAVENPORT, FRANK S., Inf.; O. T. S. Oct. 10 to Dec. 9, 1918.
- DAVIDSON, DONALD G., Jan. 5, 1918. A. E. F., April 5, 1918, to July 6, 1919. 305th Inf., 77th Div. Vesle, Meuse-Argonne, Bacarrat, Oise-Aisne. Wounded by shrapnel. Discharged July 22, 1919.

## M. A. C. IN THE WAR

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DAVIS, ORRIN C., Inf.; O. T. S. Oct. 10 to Nov. 25, 1918.

DELAHUNT, JOHN K., O. T. S.

DERICK, GLENDON R., S. A. T. C. Oct. 10 to Dec. 10, 1918.

DEWING, WARREN M., Inf. July 5, 1918, to Jan. 10, 1919.

DOUCETTE, CHARLES F., S. A. T. C. Oct. 10 to Dec. 16, 1918.

DOUGLASS, DONALD C., Air Service. May 25 to Dec. 11, 1918.

DWYER, JAMES E., June 21, 1918. U. S. N. R. F. Destroyer Force, Pacific Fleet. Discharged July 6, 1920.

EDMONDS, REGINALD W., Naval Aviation. Dec. 1, 1917, to February, 1919.

EMERY, HERBERT M., S. A. T. C. Nov. 4 to Dec. 21, 1918.

FARNSWORTH, RICHARD W., Inf.; O. T. S. Oct. 10 to Nov. 23, 1918.

FULLER, LORENZO, Inf.; O. T. S. Oct. 15 to Nov. 23, 1918.

GORWAIZ, RICHARD.

GRAFF, LELAND S., Inf. July 16 to Dec. 6, 1918.

GRAVES, CARLISLE F., Inf. Oct. 10, 1918, to Jan. 15, 1919.

GRAY, IRVING E., Air Service. Dec. 28, 1917, to April 3, 1919.

GROUT, NATHAN, M. T. C. Aug. 15, 1918, to June 18, 1919.

GUSTAFSON, WILLIAM M., U. S. N. R. F. July 2, 1918, to July 7, 1919.

HALE, FRANK T. C., S. A. T. C. Oct. 10 to Dec. 12, 1918.

HAMLIN, HAZEN W., Inf.; O. T. S. Oct. 1 to Nov. 23, 1918.

HARRINGTON, HAROLD L., Inf.; O. T. S. Oct. 10 to Nov. 23, 1918.

HARVEY, E. ERSKINE, Inf. Oct. 6 to Nov. 6, 1917; July 23 to 30, 1918.

HATHAWAY, RICHMOND H., U. S. N. R. F. Sub-chaser No. 239, Sept. 28, 1917, to July 2, 1919.

HATHAWAY, WARREN S. Died from wounds Nov. 4, 1918.  
(See page 57.)

## M. A. C. IN THE WAR

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- HAYNES, CHARLES F., S. A. T. C. Oct. 10 to Dec. 15, 1918.
- HEMENWAY, CARL M., Aug. 9, 1916. A. E. F., Sept. 25, 1917, to April 23, 1919. Co. I, 104th Inf., 26th Div. Chemin-des-Dames, Toul, Apremont, Marne, Aisne-Marne, St. Mihiel, Troyon, Meuse-Argonne. Discharged May 2, 1919.
- HIGGS, JOHN A., Med. Dept. June 2, 1918, to March 26, 1919.
- HILL, THEODORE, JR., S. A. T. C. Sept. 25 to Nov. 25, 1918.
- HILLABOLD, CHARLES K., F. A.; O. T. S. Oct. 9 to Dec. 19, 1918.
- HOLLAND, F. HAROLD, S. A. T. C. Oct. 10 to Dec. 10, 1918.
- HOLLOWAY, JOHN W., S. A. T. C. Oct. 15 to Dec. 12, 1918.
- HORNE, ROBERT S., Inf.; O. T. S. Aug. 28 to Dec. 18, 1918.
- HURD, DAVIS A., C. A. C. Oct. 21 to Dec. 19, 1918.
- HURD, GORDON K., Inf. July 18 to Dec. 20, 1918.
- IORIO, CARLO A., Inf.; O. T. S. Dec. 6, 1917, to Dec. 16, 1918.
- JAKEMAN, BROOKS F., Inf. S. A. T. C. Oct. 10 to Dec. 4, 1918.
- JONES, EDSON T., O. T. S. Oct. 10 to Dec. 5, 1918.
- LAMBERT, RICHARD B., Inf. Oct. 10, 1918, to Feb. 15, 1919.
- LENT, DONALD A., 48th Bn. Scotch Kilties, Canadian Army. Sept. 23 to Dec. 10, 1918.
- LINDQUIST, HARRY G., Oct. 7, 1917. A. E. F., Feb. 26, 1918, to April 7, 1919. Co. M, 102d Inf., 26th Div. Seicheprey, Toul, Château-Thierry, St. Mihiel, Verdun, Argonne. Wounded by shrapnel Oct. 25, 1918. Discharged April 28, 1919.
- LITTLEFIELD, JOHN E., S. A. T. C. Oct. 14 to Dec. 16, 1918.
- LOTHRUP, EARLE D., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- LUCE, WILLIAM A., Marine Corps. July 11, 1918, to Jan. 9, 1919.

## M. A. C. IN THE WAR

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- LYONS, HENRY E., Inf.; O. T. S. Oct. 1 to Nov. 23, 1918.
- MACLEOD, GUY F., Naval Aviation. June 25 to Nov. 30, 1919.
- MALLON, CHARLES H., U. S. N. R. F. Dec. 17, 1917, to Feb. 12, 1919.
- MANGUM, ANDREW B., May 5, 1917. A. E. F., July 5 to Dec. 2, 1918. Med. Dept., Base Hospital No. 7. Still in service.
- MAPLES, JAMES C., U. S. N. R. F. Aug. 3 to Dec. 14, 1918.
- MARTIN, LAURENCE P., Aug. 27, 1918. A. E. F., September, 1918, to August, 1919. Co. C, 304th Bn., Tank Corps. Discharged Aug. 26, 1919.
- MCDONALD, MILTON C., June 9, 1917. A. E. F., Jan. 9, 1917, to June 6, 1919. U. S. A. A. S., Sect. 544. Aisne defensive, Champagne-Marne, Aisne-Marne, Oise-Aisne. Awarded Croix de Guerre. Discharged June 11, 1919.
- MESERVE, ALBERT W., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- MUNROE, RAYMOND F., Inf. Sept. 6 to Dec. 21, 1917.
- MURRAY, HARRY A., Jr., Med. Dept. Aug. 11, 1917, to Aug. 28, 1919.
- NEWELL, PHILIP S., C. A. C. Oct. 21, 1918, to Jan. 4, 1919.
- OPPE, HERMAN D., S. A. T. C. Oct. 28 to Dec. 16, 1918.
- PAIGE, JOSEPH C., Air Service. Nov. 8 to Dec. 31, 1918.
- PECKHAM, WILLIAM H., Inf.; O. T. S. Oct. 10 to Nov. 21, 1918.
- PHILLIPS, S. AUSTIN, Hospital Corps. U. S. N. R. F. April 14, 1917, to May 23, 1919.
- PORTECK, HENRY G., S. A. T. C. Nov. 26 to Dec. 21, 1918.
- PUTNAM, FREDERIC H., F. A. June 1, 1918, to Jan. 10, 1919.
- QUADLAND, HOWARD P., Inf. June 3 to Dec. 26, 1918.
- READIO, PHILIP A., Inf. Oct. 10, 1918, to Jan. 15, 1919.
- REDDING, GEORGE K., Inf.; O. T. S. Oct. 10 to Nov. 24, 1918.

## M. A. C. IN THE WAR

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- RICHARDS, GEORGE H., Air Service. Jan. 4 to Dec. 11, 1918.
- RICHARDSON, MARK M., Sept. 21, 1917. A. E. F., July 12, 1918, to June, 1919. 405th Depot Dept.; Hdqrs. Co., 301st Engrs., 76th Div. St. Mihiel, Meuse-Argonne. Army of Occupation. Discharged June 22, 1919.
- ROBERTS, IVAN A. Died from wounds Oct. 1, 1918. (See page 60.)
- ROBERTSON, WILLIAM F., Air Service. Jan. 4, 1918, to Jan. 18, 1919.
- SANBORN, JOSEPH R., Inf.; Chemical Warfare Service. Sept. 2, 1918, to Jan. 10, 1919.
- SANDERSON, RALPH H., S. A. T. C. Oct. 10 to Dec. 15, 1918.
- SCOTT, CLINTON W., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- SHATTUCK, CARL W., Air Service. Jan. 3 to Dec. 18, 1918.
- SHAUGHNESSY, HOWARD J., Aug. 8, 1918. A. E. F., Nov. 1, 1918, to April 25, 1919. Tank Corps. Discharged May 21, 1919.
- SILVERMAN, JOSEPH, S. A. T. C. Oct. 14 to Dec. 3, 1918.
- SIMMONS, LESTER W., Inf.; O. T. S. Oct. 10 to Nov. 23, 1918.
- SMITH, FRED G., Air Service. Dec. 20, 1917, to April 1, 1919.
- SMITH, HERBERT T., S. A. T. C. Oct. 5 to Dec. 14, 1918.
- SMITH, RAYMOND A., November, 1917. U. S. N. R. F. Destroyer Service.
- SMITH, RAYMOND N., Naval Aviation. Jan. 30 to Dec. 10, 1918.
- SNOW, JOHN D., Air Service. May, 1918, to January, 1919.
- SPENCER, WILLIAM, Feb. 17, 1918. A. E. F., July 16, 1918, to June 22, 1919. San. Squad. No. 50, 302d Inf., 76th Div. Discharged June 30, 1919.
- STEDMAN, RALPH S., O. T. S. Oct. 10 to Dec. 5, 1918.
- STILES, WILLIAM B., June 5, 1918. A. E. F., April 20, 1918. Co. C, 306th Inf.; Hdqrs. Div., 77th Div.; 309th Inf.,



## M. A. C. IN THE WAR

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78th Div.; Co. F, 28th Inf., 1st Div.; Co. L, 356th Inf., 89th Div. St. Mihiel, Meuse-Argonne, Serieux Farm, Sedan. Army of Occupation.

STRECKER, EDMUND H., Nov. 4, 1918. Marine Corps. A. E. F., February to July, 1919. Discharged Oct. 4, 1919.

SULLIVAN, WALTER M., Inf. Oct. 10, 1918, to Jan. 15, 1919.

SWEENEY, FRANK J., Inf.; Chemical Warfare Service. May 16, 1918, to March 4, 1919.

TALMAGE, HARRY J., Inf. July 23, 1918, to Jan. 22, 1919.

TAYLOR, ELLIOT H., Inf.; O. T. S. Oct. 10 to Nov. 23, 1918.

TAYLOR, THORNTON G., S. A. T. C. Oct. 10 to Dec. 16, 1918.

TORREY, CONVERSE H., U. S. N. R. F. Oct. 5 to Dec. 16, 1918.

TURNER, ALFRED W., May 14, 1917. B. E. F., May, 1918, to Dec. 21, 1918. 15th Bat., Canadian F. A. Amiens, Arras, Drocourt-Queant Line. Discharged April 7, 1919.

URQUHART, JOHN W., S. A. T. C. Oct. 1 to Nov. 19, 1918.

VIGEZZI, JOHN D., Med. Dept. Oct. 7, 1917, to Sept. 16, 1919.

WARE, MASON, Marine Corps. Sept. 19, 1917, to Dec. 22, 1918.

WAUGH, FREDERICK V., July 20, 1917. A. E. F., August, 1917, to April 3, 1919. U. S. Army Ambulance Service, Unit No. 539. Tahure, Louvain, St. Hilaire, Jumel, Aisne-Marne, Oise-Aisne, Ypres-Lys. Awarded Croix de Guerre, October, 1918. Discharged April 10, 1919.

WHEELER, RUSSELL H., U. S. N. R. F. July 18, 1918, to Feb. 21, 1919.

WILLIAMS, ALLEN C., S. A. T. C. Oct. 10 to Dec. 16, 1918.

WOODWARD, RALPH, Jr., S. A. T. C. Oct. 10 to Dec. 10, 1918.

WRIGHT, KENNETH Y., Inf. Aug. 15, 1917, to Jan. 29, 1919.

WRIGHT, STUART E., U. S. N. R. F. May 27 to Dec. 13, 1918.

## M. A. C. IN THE WAR

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### CLASS OF 1921

- ALEXANDER, RALPH E., Inf. July 5, 1918, to date.
- ALGER, JAMES W., S. A. T. C. Oct. 20 to Dec. 17, 1918.
- ALLEN, HENRY V., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- ANDERSON, CHARLES H., S. A. T. C. Oct. 31 to Dec. 16, 1918.
- BAKER, LOUIS E., S. A. T. C. Oct. 11 to Dec. 12, 1918.
- BAKER, RUSSELL D., S. A. T. C. Oct. 31 to Dec. 16, 1918.
- BARTLETT, JOHN L. B., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- BENNETT, J. STANLEY, S. A. T. C. Oct. 10 to Dec. 10, 1918.
- BOWEN, WILLARD L., Jr., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- BRIGHAM, JOHN D., O. T. C. Oct. 10 to Nov. 23, 1918.
- BROWN, CHARLES H., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- BROWN, PAUL B., S. A. T. C.
- BROWN, PAUL W., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- CALHOUN, SALTEAU F., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- CASCIO, PETER J., Inf. Oct. 10, 1918, to Feb. 15, 1919.
- COOK, DONALD H., Naval Aviation. Aug. 8 to Nov. 8, 1918.
- COOMBS, ROGER C., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- COOPER, LAWRENCE M., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- DAVOL, PERCY W., S. A. T. C. Oct. 15 to Dec. 15, 1918.
- DAY, ROLAND W., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- DEAN, HERMAN N., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- EDMAN, GEORGE W., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- EVERS, JOSEPH D., S. A. T. C. Oct. 10 to Dec. 21, 1918.
- FISHER, LEANDER W., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- FLETCHER, FRANCIS S., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- FOGG, LLOYD C., S. A. T. C. Oct. 15 to Dec. 15, 1918.

## M. A. C. IN THE WAR

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- FREEMAN, STANLEY L., S. A. T. C. Oct. 10 to Dec. 15, 1918.
- GALUSHA, MARK H., Inf. Oct. 10, 1918, to Jan. 15, 1919.
- GASKILL, HARLAND E., U. S. N. R. F. Aug. 18 to Dec. 17, 1918.
- GEER, HERBERT L., Inf., O. T. S. July 25 to Nov. 25, 1918.
- GOULD, ROBERT M., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- HAGER, JOSEPH A., Inf. Aug. 23, 1917, to Dec. 18, 1918.
- HALLETT, MELVIN B., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- HASKINS, HAROLD A., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- HASTINGS, JOHN W., Inf. Aug. 25 to Dec. 1, 1918.
- HODGSON, ROBERT M., Inf.; O. T. S. Sept. 10 to Nov. 27, 1918.
- HOWARD, FREDERICK, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- HOWARD, WINTHROP W., Inf.; O. T. S. Oct. 10 to Nov. 23, 1918.
- JOHNSON, CONRAD J., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- KENDALL, CHARLES D., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- KILE, TRUEMAN. Died of disease Dec. 6, 1918. (See page 58.)
- KING, STARR M., Inf. Oct. 6, 1917, to Jan. 6, 1919.
- KIRKLAND, LYLE L., Inf.; O. T. S. Oct. 10 to Nov. 24, 1918.
- KROECK, JULIUS, Jr., April 4, 1918. A. E. F., May 16, 1918, to March 6, 1919. Co. L, 108th Inf., 27th Div. Vierstaad Ridge, East Poperinghe, Dickebusch sector, Hindenburg Line. Wounded. Discharged March 31, 1919.
- LABROVITZ, EDWARD B., S. A. T. C. Oct. 1 to Dec. 11, 1919.
- LACROIX, DONALD S., Inf. July 20, 1918, to Jan. 18, 1919.
- LEAVITT, RALPH G., C. A. C. Oct. 16 to Dec. 11, 1918.
- LEVINE, MAURICE E., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- LOCKWOOD, GEORGE R., Inf.; O. T. S. Oct. 10 to Nov. 23, 1918.
- LONG, ALBERT D., S. A. T. C. Oct. 10 to Dec. 16, 1918.

## M. A. C. IN THE WAR

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- MACCORMACK, RALPH R. Killed Feb. 7, 1919. (See page 59.)
- MACKINTOSH, CHARLES G., Inf.; O. T. S. Oct. 10 to Dec. 18, 1918.
- MARSH, WALTER A., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- MARTIN, EDWARD W., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- MCCARTHY, JUSTIN J., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- MEISTER, JOHN J., Naval Unit, Harvard University. Oct. 1 to Dec. 17, 1918.
- MELLEN, RICHARD A., Inf. Oct. 10, 1918, to Jan. 15, 1919.
- MILLER, WILLIAM H., F. A. July 16 to December, 1918.
- MILLINGTON, WALTER R., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- NUBER, RALPH E., Inf. July 16 to Dec. 6, 1918.
- PALMER, WALTER I., Inf. July 18 to Dec. 16, 1918.
- PECK, RICHARD C., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- PRATT, LAWRENCE F., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- PRESTON, EVERETT C., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- QUINT, ISADORE G., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- REED, PAUL M., Inf.; O. T. S. Oct. 10 to Nov. 23, 1918.
- RICE, HENRY L., Inf.; O. T. S. Oct. 10 to Dec. 21, 1918.
- ROBINSON, PHILIP L., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- ROGERS, CHARLES B., Naval Unit, Harvard University. Oct. 3 to Dec. 9, 1918.
- ROSOFF, SAMUEL N., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- SAMPSON, HOWARD J., Inf.; O. T. S. Oct. 10 to Nov. 23, 1918.
- SANDY, CECIL H. B., Marine Corps. June 18, 1918, to Nov. 15, 1919.
- SANFORD, RICHARD H., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- SLATE, GEORGE H., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- SLOAN, KENNETH W., S. A. T. C. Oct. 10 to Dec. 16, 1918.

## M. A. C. IN THE WAR

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- SMITH, JULIAN D., S. A. T. C. Oct. 10 to Dec. 21, 1918.
- SMITH, RICHARD W., Jr., S. A. T. C. Oct. 12 to Dec. 13, 1918.
- SPENCER, ORVILLE H., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- STARKEY, ROBERT L., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- STEBBINS, FREDERICK O., O. T. S. July 22 to Dec. 16, 1918.
- STEVENS, RALPH S., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- THYBERG, GEORGE J., F. A. July 29 to Dec. 12, 1918.
- VINTEN, C. RAYMOND, Jan. 10, 1918. U. S. N. R. F. Transport Service, June 6 to Nov. 19, 1918. Discharged June 12, 1919.
- WEBSTER, MILTON F., F. A. May 20 to Nov. 27, 1918.
- WHITTLE, WALLACE L., U. S. N. R. F. Sept. 24 to Dec. 19, 1918.
- WOOD, CLARENCE M., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- ZERCHER, FREDERICK K., S. A. T. C. Oct. 10 to Dec. 16, 1918.

### CLASS OF 1922

- ACHESON, ROGER M., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- AMES, NATHANIEL J., Marine Corps. Aug. 6 to Dec. 18, 1918.
- ANDREWS, JOHN H., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- ARMS, PHILIP B., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- ARMS, RICHARD W., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- BAINTON, HUBERT J., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- BAKER, GEORGE L., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- BARNES, FRANKLIN A., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- BARROWS, EDWARD F., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- BECKWITH, ROBERT H., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- BENT, LESTER D., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- BLESSINGTON, JAMES B., S. A. T. C. Oct. 10 to Dec. 11, 1918.

## M. A. C. IN THE WAR

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- BRIDGMAN, WILLIAM E., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- BROMLEY, STANLEY W., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- BRUCE, FREDERICK R., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- BUCK, CHARLES A., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- BURNHAM, EDWIN G., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- CAREY, EDMUND T., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- CATE, HERMAN W., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- CHAPIN, ELLIS W., Jr., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- COLES, HOWARD F., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- COLLINS, HERBERT L., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- CONANT, LUMAN B., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- CRICHTON, PETER A., S. A. T. C. Oct. to Dec. 18, 1918.
- CROSS, CHARLES S., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- CUMMINGS, ROBERT, S. A. T. C. Oct. 10 to Dec. 11, 1918.
- DAVIS, HAROLD S., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- DUBOIS, HAROLD G., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- EASTWOOD, JOHN E., Inf.; O. T. S. Oct. 10 to Nov. 24, 1918.
- EATON, JAMES H., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- EBERLEIN, WILLIAM J., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- ELDRIDGE, DEAN S., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- ERYSIAN, HARRY A., S. A. T. C. Oct. 9 to Dec. 5, 1918.
- FARWELL, CHARLES A., U. S. N. R. F. April 23, 1918, to Oct. 4, 1919.
- FENTON, JAMES, S. A. T. C. Oct. 10 to Dec. 17, 1918.
- FISKE, DAVID A., April 10, 1917. A. E. F. Co. I, 104th Inf., 26th Div. Soissons, Woivre, Toul, Apremont, Seicheprey, Xivray. Wounded by shell at Xivray. Cited for gallantry in action April 10 to 14, 1918. Discharged Dec. 27, 1918.
- FRILEN, KARL A., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- GILBERT, FRANK A., S. A. T. C. Oct. 10 to Dec. 16, 1918.

## M. A. C. IN THE WAR

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- GILES, CLIFTON F., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- GLOBUS, JOSEPH, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- GOWDY, CARLYLE H., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- GRAVES, JAMES A., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- HAWLEY, ROBERT R., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- HEATHCOTE, EARL W., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- HIGGIN, ALBERT S., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- HOOPER, FRANCIS E., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- HOOPER, OLIVER F., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- HOWARD, ELMER S., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- JACKSON, BELDING F., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- JACOBS, ALBERT F., S. A. T. C. Oct. 10 to Dec. 15, 1918.
- JARVIS, ALBERT A., C. A. C. Oct. 21 to Dec. 23, 1918.
- JARVIS, HAROLD N., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- JOST, NELSON M., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- KEMP, GEORGE A., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- KENNEY, CHESTER D., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- KRASKER, ABRAHAM, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- LAW, HARVEY F., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- LAWRENCE, ROBERT P., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- LAWTON, HAROLD H., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- LEONARD, EARLE S., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- LEWANDOWSKI, JOHN N., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- LEWIS, EDWARD W., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- LINGHAM, ROBERT M., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- LOCKHART, JOHN H., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- LOVELL, HOLLIS R., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- LOWERY, JOHN G., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- LYONS, EDGAR A., S. A. T. C. Oct. 10 to Dec. 12, 1918.

## M. A. C. IN THE WAR

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- MACARDLE, HERBERT A., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- MOODY, KENNETH W., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- MOSELEY, HENRY S., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- MURRAY, MYRON G., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- PAIGE, HOWARD L., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- PALMER, RAY, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- PECK, WILLIAM H., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- PHELPS, HARLEY P., S. A. T. C. Oct. 10 to Dec. 3, 1918.
- PICKUP, EZRA A., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- PURINGTON, GEORGE R., S. A. T. C.
- RANDALL, KENNETH C., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- RIVKIN, JULIUS M., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- ROLLINS, WALTER J., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- ROSER, CONRAD H., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- RUSSELL, RALPH, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- SLOBIN, HAROLD M., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- SMITH, ALBERT W., S. A. T. C. Oct. 10 to Dec. 17, 1918.
- SMITH, MAXFIELD M., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- SMITH, STEWART V., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- SPADEA, JAMES V., S. A. T. C. Oct. 18 to Dec. 5, 1918.
- STEBBINS, FREDERICK O., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- STEPHAN, HENRY W., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- STEVENS, SETH E., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- STOWELL, PRESTON D., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- STUBING, ERNEST S., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- SULLIVAN, JOSEPH T., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- SWIFT, A. LAWRENCE, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- TANNER, WILLIS, S. A. T. C. Oct. 10 to Dec. 16, 1918.



## M. A. C. IN THE WAR

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- TASK, MORTIMER, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- TAYLOR, CLARENCE L., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- TAYLOR, LEROY B., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- THOMPSON, GEORGE H., Jr., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- TUCKER, FRANCIS S., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- WALKER, ALBERT N., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- WALSH, JOHN L., S. A. T. C. Oct. 1 to Dec. 16, 1918.
- WASON, RAYMOND, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- WENTSCH, HAROLD E., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- WHITAKER, HOLDEN, S. A. T. C. Oct. 10 to Dec. 16, 1918.
- WHITE, GEORGE E., S. A. T. C. Oct. 10 to Dec. 16, 1918.
- WILSON, CHARLES W. S., S. A. T. C. Oct. 10 to Dec. 11, 1918.

### CLASS OF 1923

- ALEXANDER, DONALD B., May 7, 1917. A. E. F., Oct. 10, 1917, to April 10, 1919. Bat. B, 103d F. A., 51st Brig., 26th Div. Chemin-des-Dames, Toul, Château-Thierry, St. Mihiel, Meuse-Argonne, Verdun. Discharged April 29, 1919.
- BEAL, JAMES A., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- BORGESON, MELVIN B., Feb. 7, 1915. A. E. F., Oct. 4, 1917, to April 4, 1919. Co. C, 104th Inf. Chemin-des-Dames, Toul, Marne, Aisne-Marne, St. Mihiel, Meuse-Argonne, Troyon. Discharged April 28, 1919.
- BUELL, ROBERT A., S. A. T. C.
- FRIEND, ROGER B., May 21, 1917. A. E. F., Sept. 25, 1917, to Feb. 23, 1919. 101st F. A., 26th Div. Marne, St. Mihiel, Argonne. Gassed July 25, and wounded Nov. 11, 1918. Discharged May 2, 1919.
- GERRY, BERTRAM I., Oct. 5, 1917. A. E. F., May 19, 1918, to Feb. 20, 1919. 319th F. A., 82d Div. St. Mihiel, Argonne. Wounded Oct. 30, 1918. Discharged June 3, 1919.

## M. A. C. IN THE WAR

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GOLDSTEIN, JOSEPH.

IRISH, GILBERT H., May 2, 1917. A. E. F., July 2, 1917, to Jan. 28, 1919. Marine Corps. -Château-Thierry. Wounded at Château-Thierry June 15, 1918. Discharged June 25, 1919.

KNAPP, IRVING R., S. A. T. C. Oct. 1 to Dec. 19, 1918.

LATOUR, OLIVER P., April 9, 1917. A. E. F., Jan. 9, 1918, to April 14, 1919. Inf.; Sig. Corps; Air Service. Somme, Cambrai, St. Quentin. Wounded by machine gun bullet in elbow, and gassed, March 21, 1918. Awarded Croix de Guerre June 1, 1918. Discharged May 2, 1919.

MARSHALL, ALEXANDER B., Dec. 11, 1917. A. E. F., March 7, 1918, to April 25, 1919. Co. C, 56th Engrs. Somme, Meuse-Argonne. Citations: Dec. 10, 1918, order 12232 French Army; awarded Croix de Guerre. Discharged April 30, 1919.

MARTIN, ROBERT F. R., S. A. T. C. Oct. 10 to Dec. 16, 1919.

NORCROSS, HARRY C., Inf. Sept. 19, 1917, to Nov. 30, 1918.

NOWERS, DONALD G., Aug. 10, 1917. U. S. N. R. F. Transport Service April 1 to Aug. 1, 1919. Discharged Aug. 15, 1919.

RIBERO, EDWIN F., April 20, 1919. A. E. F., Oct. 1917, to July 1919. 101st Engrs., 26th Div. Champagne-Marne, Aisne-Marne, St. Mihiel, Meuse-Argonne. Discharged July 26, 1919.

RICHARDS, HOMER F., Air Service. Jan. 11 to June, 1918.

SARGENT, RICHMOND H., Oct. 25, 1915. A. E. F., July 1, 1918, to March 25, 1919. 6th, 19th, 17th, 4th Co., C. A. C.; Bat. B., 54th C. A. C.; Bat. E, 72d C. A. C. Discharged March 30, 1919.

SHARPE, CHARLES G., Sept. 22, 1917. A. E. F., July 9, 1918, to May 1, 1919. 301st Train Hdqrs. Discharged May 5, 1919.

WOODWORTH, LEVERETT S., U. S. N. R. F. Sept. 28, 1917, to Sept. 19, 1919.

## M. A. C. IN THE WAR

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### CLASS OF 1924

- CROMACK, EARL A., F. A. Sept. 3, 1918, to Jan. 31, 1919.
- ELLIOTT, JAMES A., Feb. 28, 1918. A. E. F., October, 1918, to Jan. 5, 1919. Co. C, 345th Inf., 87th Div. Discharged Feb. 3, 1919.
- GRIEVE, ALEXANDER N., S. A. T. C. Oct. 21 to Dec. 5, 1918.
- HOSMER, FRANK H., U. S. N. R. F.
- OKLOBDZIA, BORIS, September, 1912. Serbian Army. Belgrad, Drina, Sava, Rujno, Gilave, Preshevo, Katchanik. Discharged December, 1915.
- PALMER, HAROLD C., U. S. N. R. F. Oct. 20, 1916. Destroyer Service, U. S. S. "Sampson," February, 1917, to August, 1918. Discharged Nov. 1, 1920.
- TURNER, DANA B., Nov. 30, 1917. U. S. N. R. F. Sea Service May, 1918, to December, 1919. Discharged Dec. 4, 1919.
- WEATHERWAX, H. EARLE, July 15, 1918. U. S. N. R. F. Sea Service, U. S. S. "Blakeley," in Adriatic and Mediterranean, June 10 to Aug. 16, 1919. Discharged Aug. 30, 1919.

### GRADUATE STUDENTS

- AVERY, ROY C.
- BAINE, ERNEST S., Oct. 13, 1917. A. E. F., Sept. 29, 1918, to June 18, 1919. Aviation Sect., Sig. Corps; Co. B, 605th Engrs. Discharged June 25, 1919.
- BALES, HAROLD C., Ord. Dept. March 5 to Dec. 23, 1918.
- CHEPLIN, HARRY A., Base Hospital Laboratory.
- COBB, J. STANLEY, Jan. 17, 1918. A. E. F., April 7 to Nov. 23, 1918; March 10, 1918, to March 11, 1919. Co. B, 74th Engrs. St. Mihiel, Toul. Discharged March 24, 1919.
- COWELL, HAROLD J., Dec. 6, 1917. A. E. F., April 7 to Nov. 23, 1918. 224th Aero Squad. Discharged Dec. 20, 1918.

## M. A. C. IN THE WAR

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DAVIES, ERNEST L. Killed in action Oct. 21, 1916. (See page 52.)

ETTER, ARTHUR E., Dec. 11, 1917. A. E. F., April 7, 1918, to June 19, 1919. Naval Aviation. Discharged June 19, 1919.

FENN, DONALD F., S. A. T. C. Oct. 18 to Dec. 4, 1918.

FISH, ERNEST E. A. E. F., July 10, 1918, to July 6, 1919. F. A. Discharged July 15, 1919.

JOHNSON, LEONARD H., Dec. 12, 1917. A. E. F., June 28, 1918, to June 5, 1919. Air Service. St. Mihiel, Argonne. Wounded Sept. 17, 1918, in parachute drop. Discharged June 5, 1919.

MARTIN, JOHN E. Died of disease Dec. 12, 1918. (See page 59.)

NORTON, JOHN B., Air Service. Aug. 29 to Dec. 30, 1918.

OBERHELMAN, CARL F., March 14, 1918. A. E. F., July 5, 1918, to July 1, 1919. Co. C., 29th Engrs. Discharged July 24, 1919.

PAULEY, WILLIAM C., O. T. S.

PAYNE, WILLIAM T., San. Corps. Sept. 13, 1918, to Jan. 13, 1919.

PHILLIPS, ARTHUR W., U. S. N. R. F. Discharged May 22, 1919.

PRINCE, ARTHUR L., Inf.; Med. Dept. Sept. 20, 1917, to Jan. 24, 1919.

PURINGTON, JAMES A., Dec. 13, 1917. A. E. F., Jan. 23, 1918, to July 2, 1919. 18th Co., 20th Engrs. Wrecked on "Tuscania." Discharged July 10, 1919.

RAND, FRANK P., Med. Corps. Sept. 3, 1918, to July 11, 1919.

ROOT, IRVING C., F. A. Aug. 27, 1918, to Jan. 10, 1919.

THOMPSON, W. BRADLEY, Dec. 15, 1917. U. S. N. R. F. Transport Service. Discharged May 8, 1919.

WHITE, DONALD, Inf. July 22, 1918, to Jan. 31, 1919.

## M. A. C. IN THE WAR

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WHITTIER, WARREN F.

WOOD, ELWIN G., Dec. 10, 1917. A. E. F., May 10, 1918, to March 22, 1919. 20th Engrs. Discharged April 15, 1919.

### UNCLASSIFIED STUDENTS

ALLEN, ARTHUR F., S. A. T. C. Jan. 28 to Dec. 14, 1918.

ANDERSON, GUST W., S. A. T. C. Oct. 10 to Dec. 10, 1918.

BRAWN, HOWARD D., June 22, 1918. A. E. F., July, 1918.  
Hdqs. Det., 151st F. A. St. Mihiel.

BRETT, JOHN C., U. S. N. R. F. May 17, 1918, to Jan. 3, 1919.

BRIDGMAN, RALPH S., Inf. July 22, 1918, to Jan. 31, 1919.

BUCK, PAUL T. Killed May 24, 1919. (See page 50.)

BURT, JOHN H., Air Service. Nov. 7, 1918, to April 21, 1919.

CAMPBELL, JOHN C., Inf. Oct. 5, 1917, to Feb. 4, 1919.

CARLSON, WALTER M., S. A. T. C. Oct. 10 to Dec. 11, 1918.

CLANCY, HENRY C., U. S. N. R. F. Dec. 11, 1917, to May 22, 1919.

CLEAVER, C. LEROY, Engrs. January, 1916, to July, 1918.

CRITCHETT, EDWARD R., Naval Aviation. June 12, 1918, to Jan. 15, 1919.

CROSBY, ROBERT F., Inf. July 18 to Dec. 24, 1918.

CULVER, ROGER L., S. A. T. C. Oct. 10 to Dec. 12, 1918.

DALRYMPLE, GEORGE B., May 15, 1917. A. E. F., October, 1917, to October, 1918. Co. D, 16th Inf., 1st Div.; Co. B, 30th Inf. Cantigny, Ansanville, Aisne-Marne, Montdidier-Noyon. Wounded in leg July 22, 1918. Discharged May 21, 1919.

DANIEL, SOLOMON, May 6, 1918. A. E. F., June 28, 1918, to April 28, 1919. 117th Field Sig. Bat., 42d Div. Toul. Army of Occupation. Discharged June 17, 1919.

## M. A. C. IN THE WAR

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- DAVIS, EDWIN J., April 27, 1918. A. E. F., July 16, 1918, to April 25, 1919. Hdqrs. Co., 303d F. A. St. Mihiel. Discharged May 1, 1919.
- DERBY, LLEWELYN L., Dec. 7, 1917. A. E. F., Jan. 4, 1918, to July 20, 1919. Med. Dept., Base Hospital No. 101. Army of Occupation. Discharged July 25, 1919.
- EAGER, SAMUEL W., Dec. 14, 1917. A. E. F., 18 months. 6th Bat., 20th Engrs. Discharged June 11, 1919.
- EDWARDS, CHARLES R., Inf. July 21 to Nov. 23, 1918.
- FISHER, EARL J., Air Service. July 31, 1918, to April 4, 1919.
- FITZGERALD, WILLIAM P. Killed in action July 15, 1918. (See page 54.)
- FULLER, CARROLL E. Died of disease Sept. 26, 1918. (See page 55.)
- GEOHEGAN, JAMES D., S. A. T. C. Oct. 10 to Dec. 11, 1918.
- GERRISH, ARTHUR H., S. A. T. C. Oct. 10 to Dec. 12, 1918.
- GIDNEY, PAUL D., M. T. C. Sept. 5, 1918, to Feb. 24, 1919.
- GILES, JOHN F. Killed in action April 20, 1918. (See page 56.)
- GREEN, HOWARD E., 13th Cavalry. Aug. 10, 1918, to Aug. 8, 1919.
- GRUNDLER, ADOLPH J., Inf. June 14 to Dec. 18, 1918.
- HANSON, ERNEST, Band, U. S. N. R. F. June 3, 1918, to July 22, 1919.
- HART, OWEN S., S. A. T. C. Oct. 12 to Dec. 12, 1918.
- HOLMES, JOHN F., Inf. July 22 to Dec. 13, 1918.
- HOOPER, EDWARD A. Killed in action July 29, 1918. (See page 57.)
- HOWE, JAMES S., Inf. May 7, 1917, to Jan. 31, 1919.
- HUGO, ALVIN E., S. A. T. C. Oct. 10 to Dec. 10, 1918.
- HUNNESTON, RAYMOND F., F. A. Aug. 28 to Oct. 17, 1918.
- JONES, EDWARD C., S. A. T. C. Oct. 10 to Dec. 11, 1918.

## M. A. C. IN THE WAR

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JONES, PERCIVAL, June 12, 1918. A. E. F., Aug. 23, 1918, to April 24, 1919. San. Dept., 114th Inf., 29th Div. Discharged May 27, 1919.

KARLSON, HUGO P., F. A. July 1 to Nov. 30, 1918.

KAULBACK, HUGH A., Q. M. C. June 7, 1917, to June 17, 1919.

KIMBALL, EVERETT F., 280th Aero Squad. Oct. 28, 1918, to Jan. 24, 1919.

LAPOINT, WILFRED J., U. S. N. R. F. Dec. 3, 1917, to Sept. 19, 1919.

LEONARD, NELSON E. July 23, 1918, to Jan. 28, 1919.

MATTOON, MAX W., S. A. T. C. Oct. 10 to Dec. 12, 1918.

McMURRAY, CHARLES J., F. A. Aug. 27, 1918, to Jan. 10, 1919.

MOTT, PERCIVAL, Air Service. May 14, 1917, to Nov. 25, 1918.

MORSE, LOUIS L., May 1, 1917. A. E. F., Oct. 5, 1917, to March 1, 1919. 102d Inf., 26th Div.; 109th Sig. Bn., 26th Div.; Co. C, 101st Field Sig. Bn., 26th Div. Chemin-des-Dames, Seicheprey, Toul, Xivray, Château-Thierry, St. Mihiel. Citations: Hdqrs. Co., 26th Div., May 13, 1918; Hdqrs. Co., 102d Inf., June 19, 1918. Discharged May 10, 1919.

NASH, HENRY C., Jr., Ord. Dept.; Inf. June 30, 1918, to Jan. 15, 1919.

NEILL, FRED A., Army Special Training Dept. Sept. 19 to Dec. 2, 1918.

NEWTON, RAYMOND L., June 16, 1917. A. E. F., April 15, 1918, to Aug. 4, 1919. 5th, 6th and 17th Cavalry. St. Dié, St. Mihiel, Pont-a-Mousson, Argonne. Gassed and wounded July 23, 1918. Still in service.

PERRY, JOHN T., May 24, 1917. A. E. F., Oct. 10, 1917, to Feb. 11, 1919. Co. B, 101st Engrs., 26th Div. Seicheprey, Château-Thierry, St. Mihiel, Verdun. Gassed July 15 and Nov. 9, 1918. Discharged March 13, 1919.

## M. A. C. IN THE WAR

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PIERCE, HARRY W., Med. Dept. Sept. 2, 1917, to Dec. 6, 1918.

RAY, FREDERICK A., Oct. 4, 1917. A. E. F., July 6, 1918, to Oct. 12, 1919. Co. E, 301st Inf., 76th Div.; Co. L, 162d Inf., 41st Div.; Prisoner of War Escort Co. No. 262. Discharged Oct. 18, 1919.

REED, FRANK H., S. A. T. C. Oct. 10 to Dec. 10, 1918.

RICHARDS, EDWIN H., Inf.; O. T. S. Oct. 3 to Nov. 23, 1918.

RICHARDSON, ROYAL P., Jan. 3, 1917. U. S. N. R. F. Transport Service. Still in service.

ROBINSON, NATHAN H., S. A. T. C. Oct. 10 to Dec. 16, 1918.

SEARLE, EDWARD M., June 24, 1918. A. E. F., Aug. 31 to Dec. 4, 1918. 357th Aero Squad. Discharged Dec. 17, 1918.

STOCKBRIDGE, DERRY L., U. S. N. R. F. June 26 to Oct. 2, 1918.

STRONG, JOHN R., S. A. T. C. Oct. 10 to Dec. 16, 1918.

STUDLEY, JOSHUA, C. A. C. Oct. 23 to Dec. 26, 1918.

STUDLEY, ROBERT A.

TRACY, RALPH P., S. A. T. C. Oct. 10 to Dec. 17, 1918.

TRIDER, GEORGE H., Sept. 27, 1917. A. E. F., Aug. 30, 1918, to Jan. 20, 1919. Air Service. Discharged Feb. 23, 1919.

TRULSON, GEORGE F., S. A. T. C. Oct. 10 to Dec. 18, 1918.

TUTTLE, GEORGE R., Ord. Dept. Nov. 22, 1917, to Dec. 14, 1918.

TUTTLE, KENNETH W., Air Service. Jan. 5, 1918, to Feb. 28, 1919.

WATSON, HAWKESWORTH D., Air Service. Jan. 2 to Nov. 30, 1918.

WEBBER, KARL D., S. A. T. C. Oct. 10 to Dec. 16, 1918.

WING, PHILIP H., May 31, 1918. U. S. N. R. F. Convoy duty Aug. 30 to Dec. 1, 1918. Discharged Dec. 16, 1918.



## M. A. C. IN THE WAR

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WINTER, HENRY C., Nov. 20, 1917. A. E. F., Jan. 14, 1918, to June 11, 1919. 301st M. T. C. Discharged June 19, 1919.

WRIGHT, WHITCOMB W., Inf.; S. A. T. C. Oct. 10 to Dec. 16, 1918.

### FACULTY

ALLEN, WINDOM A. Died of disease Jan. 31, 1919. (See page 49.)

BRONSON, WESLEY H., U. S. N. R. F., Ensign. Oct. 17, 1917, to Jan. 27, 1919.

BUTTERFIELD, KENYON L., President. Y. M. C. A., Nov. 30, 1918. Army Educational Corps, April to June 23, 1919. A. E. F., Nov. 30, 1918, to June 23, 1919.

CANCE, ALEXANDER E., Y. M. C. A., January to April, 1919. U. S. Army, April to July, 1919. A. E. F., January 30 to July, 1919.

DRAIN, HENRY D., Inf. July 23 to Dec. 8, 1918.

GAGE, GEORGE E., Sanitary Corps, A. E. F.

HAZELTINE, BURT A., U. S. N. R. F. June 18, 1917, to Aug. 7, 1919.

HICKS, CURRY S., Inf. June 3, 1918, to Jan. 6, 1919.

HOOD, EGERTON G., Med. Dept. Aug. 28, 1918, to Sept. 8, 1919.

KILHAM, AUSTIN D., Inf.

LENTZ, JOHN B. A. E. F., April 15, 1918, to June 16, 1919. Ambulance Co. 111; C. O. Corps Mobile Vet. Hosp. No. 1; C. O. Vet. Hosp. 2B. Aisne-Marne, Meuse-Argonne. Discharged June 20, 1919.

McNUTT, JOHN C., Y. M. C. A., March 6, 1919. Army Educational Corps, April 16 to June 30, 1919. Food Div., Med. Corps. A. E. F., March 17 to June 30, 1919.

SMITH, JOHN B., San. Corps. Oct. 6, 1917, to Jan. 11, 1919.

SPRAGUE, ROBERT J., Y. M. C. A., March 6, 1919. Army Educational Corps, April 15 to July 11, 1919. A. E. F., April 15 to July, 1919.

## M. A. C. IN THE WAR

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STEWART, LLOYD L., June 24, 1918. A. E. F., Sept. 9, 1918, to April 27, 1919. 309th, 5th and 117th Field Sig. Bn. Army of Occupation. Discharged May 19, 1919.

VAN METER, RALPH A., May 27, 1918. A. E. F., July 9, 1918, to July 5, 1919. Sig. Corps. St. Mihiel, Meuse-Argonne. Citation for zealous and courageous conduct under shell fire near Gesnes, France, Oct. 20, 1918. Discharged July 11, 1919.

WAUGH, FRANK A., San. Corps. July 7, 1918, to April 1, 1919.

### MERCHANT MARINE

CALDWELL, DELMONT L., '14. Jan. 4 to Dec. 14, 1918.

TURNER, WILLIS J., '17. April 21 to Dec. 21, 1918.

HAMILTON, HOWARD M., '19. May 27-.

BERMAN, LOUIS, '20. August, 1918, to Feb. 11, 1919.

QUINCY, PERCY E., '20. June 18, 1918, to Jan. 19, 1919.

BUCK, HORACE G., '21. July 8, 1918, to April 16, 1919.

MUTTY, ALLAN V., '21. May 9, 1918, to April 9, 1919.

### RED CROSS AND WELFARE ORGANIZATIONS

PAIGE, WALTER C., '91, Y. M. C. A. Jan. 7, 1918. Divisional Secretary at Neuers, France, January to March, 1918. Hut Secretary at Pauillac and Tremblecourt, France, March to August, 1918. Discharged Oct. 1, 1919.

HALEY, GEORGE W., '92, Y. M. C. A. With French Army. A. E. F., May, 1918.

FROST, HAROLD L., '95, American Red Cross, March 4, 1918. A. E. F., April 14, 1918, to Feb. 22, 1919. Captain. Built up Frost Unit for developing hospital farms in France; Chief, Hospital Farm and Garden Service; Chief, Damages in Allied Countries. Discharged March 3, 1919.

BROWN, F. HOWARD, '00, April 30, 1918. A. E. F., July 1 to Dec. 21, 1918. American Red Cross. 1st Lieutenant. Discharged Jan. 1, 1919.

## M. A. C. IN THE WAR

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- SWAIN, ALLEN N., '05, American Red Cross. Captain. May 20, 1918. A. E. F., May, 1918, to May, 1919. Discharged May 16, 1919.
- CRAIGHEAD, WILLIAM H., '06, Y. M. C. A.
- FARRAR, ALLAN D., '06, Y. M. C. A. Social Secretary at Camp Devens. June 30, 1918, to Aug. 1, 1920.
- WATTS, RALPH J., '07, Y. M. C. A. Camp Devens. June 30 to July 31, 1918.
- SMITH, HALLIDAY S., '10, Y. M. C. A. Overseas contingent. Killed in action May 26, 1918. (See page 61.)
- CARPENTER, JESSE L., '12, Y. M. C. A. Secretary, Naval Rifle Range, Peekskill, N. Y. Nov. 1, 1918, to April 1, 1919.
- GRAY, FRANK L., '12, Y. M. C. A. Social Director, Fort Rodman. September, 1917, to July 31, 1920.
- CURTIS, HAROLD W., '13, Y. M. C. A. Fort Constitution and Fort Preble. December, 1917, to April 1, 1919.
- MOORE, ELBERT F., '15, Y. M. C. A. Dramatic Director. A. E. F.
- WELLS, HARRY A., '16, Y. M. C. A. Physical Director, Camp Hancock.
- CLARK, STEWART S., '18, Y. M. C. A. Camp Boxford and Camp Bartlett. June to October, 1917.
- VAN ALSTYNE, LEWIS M., '18. Physical Director, Base Hospital, Hempstead, Long Island.
- HOLMGREN, RICHARD S., '19, June 3, 1918. A. E. F., Sept. 20, 1918, to Oct. 8, 1919. American Friends Reconstruction Unit. Discharged Oct. 9, 1919.
- DAVIS, FRANK L., '23, American Library Association. Aug. 1, 1918, to Aug. 1, 1919. Camp Merritt, New Jersey, and Camp Devens.
- FISKE, HOWARD B., Unclassified. Y. M. C. A. Social Director, Camp Dix. March 17, 1918, to Jan. 1, 1919.

## M. A. C. IN THE WAR

GREEN, CHARLES R., Faculty. Acting Camp Librarian, American Library Association. Camp Johnson, Jacksonville, Fla. June to August, 1918.

PHELAN, JOHN, Faculty. Y. M. C. A. Camp Devens. May 1 to June 30, 1918.

### SUMMARY OF SERVICE LIST

	Total in Service of Army and Navy.	Com- missioned Officers.	Overseas.	Deaths.	Addi- tional in Merchant Marine.	Additional in Service of Red Cross and Welfare Organiza- tions.
Faculty, . . . .	17	8	8	1	-	2
Class:						
1878, . . . .	1	1	-	-	-	-
1882, . . . .	2	2	-	-	-	-
1885, . . . .	2	2	1	-	-	-
1890, . . . .	1	1	-	-	-	-
1891, . . . .	-	-	-	-	-	1
1892, . . . .	-	-	-	-	-	1
1894, . . . .	1	1	-	-	-	-
1895, . . . .	1	1	1	-	-	1
1897, . . . .	3	3	3	-	-	-
1899, . . . .	1	1	1	-	-	-
1900, . . . .	1	1	-	-	-	1
1903, . . . .	2	2	1	-	-	-
1905, . . . .	1	1	-	-	-	1
1906, . . . .	5	4	2	-	-	2
1907, . . . .	6	4	2	-	-	1
1908, . . . .	8	6	2	1	-	-
1909, . . . .	8	3	3	-	-	-
1910, . . . .	12	5	5	3	-	1
1911, . . . .	18	6	8	2	-	-
1912, . . . .	34	17	17	1	-	2
1913, . . . .	46	24	25	6	-	1
1914, . . . .	76	36	29	2	1	-
1915, . . . .	86	35	43	1	-	1

# M. A. C. IN THE WAR

## SUMMARY OF SERVICE LIST — *Concluded*

	Total in Service of Army and Navy.	Com- missioned Officers.	Overseas.	Deaths.	Addi- tional in Merchant Marine.	Additional in Service of Red Cross and Welfare Organiza- tions.
1916, . . .	103	47	47	2	-	1
1917, . . .	130	57	57	7	1	-
1918, . . .	137	68	71	7	-	2
1919, . . .	151	56	58	7	1	1
1920, . . .	133	25	22	2	2	-
1921, . . .	88	13	3	2	2	-
1922, . . .	107	-	1	-	-	-
1923, . . .	19	2	8	-	-	1
1924, . . .	8	1	5	-	-	-
Graduate students, .	25	4	12	2	-	-
Unclassified students,	72	10	20	5	-	1
Total, . . .	1,304	446	454	51	7	21



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# STATISTICS

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# STATISTICS

## CLASSES FROM 1913 TO 1922

CLASS.	Original Enroll- ment of Men.	Number in Service.	Per Cent in Service.	Original Enroll- ment of Men.	Number in Service.	Per Cent in Service.
1913, . . . . .	134	46	34.3	-	-	-
1914, . . . . .	157	76	48.4	-	-	-
1915, . . . . .	169	86	50.9	-	-	-
1916, . . . . .	183	103	56.2	-	-	-
1917, . . . . .	200	130	65.0	200	130	65.0
1918, . . . . .	165	137	83.1	165	137	83.1
1919, . . . . .	202	151	74.2	202	151	74.2
1920, . . . . .	165	133	80.6	165	133	80.6
1921, . . . . .	112	88	78.6	112	88	78.6
1922, . . . . .	118	107	-	-	-	-
Total, . . . . .	1,605	1,053	65.8	844	639	75.7

## STUDENTS, ALUMNI AND FACULTY HOLDING COMMISSIONS DURING THE WORLD WAR

### Army

#### *Colonel*

Willard, Daniel, '82, Engineers.

Goldthwait, Joel E., '85, Medical Corps.

Keenan, George F., '99, Medical Corps.

#### *Lieutenant-Colonel*

Drury, Ralph W., '95, Infantry.

## M. A. C. IN THE WAR

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### *Major*

Hall, Josiah N., '78, Medical Corps.  
Knowles, William F., '82, Medical Corps.  
Higgins, Charles H., '94, Veterinary Corps, Canadian Army.  
Ranlett, Charles A., '97, Infantry.  
Monahan, Arthur C., '00, Sanitary Corps.  
Paul, Augustus R., '05, Infantry.  
Barry, Thomas A., '08, Coast Artillery Corps.  
Nickerson, George P., '11, Field Artillery.  
Larsen, Nils P., '13, Medical Corps.  
McLain, Ralph E., '15, Infantry.  
Babcock, Philip R., '17, Air Service.  
Day, James H., '17, Infantry.  
Lentz, John D., Faculty, Veterinary Corps.

### *Captain*

Kennedy, Frank H., '06, Quartermaster Corps.  
Tannatt, Willard C., '06, Engineers.  
Whitmarsh, Raymond D., '08, Infantry.  
Call, Almon E., '10, Engineers.  
Bent, William R., '12, Infantry.  
Gelinas, Louis E., '12, Field Artillery.  
Hills, Frank B., '12, Infantry.  
Lamson, Robert W., '12, Medical Department.  
Angier, Harris Wm., '13, Engineers.  
Brown, Herbert A., '13, Infantry.  
Clark, Norman R., '13, Infantry.  
Ells, Gordon W., '13, Infantry.  
Goodnough, Henry E., '13, Infantry.  
Brown, Harry D., '14, Infantry.  
Edmonds, Sidney W., '14, Motor Transport Corps.

## M. A. C. IN THE WAR

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Edwards, Edward C., '14, Quartermaster Corps.  
Nicolet, Tell W., '14, Quartermaster Corps.  
Nicolet, Theodore Arthur, '14, Quartermaster Corps.  
Palmer, John P., '14, Field Artillery.

Cohen, Samuel A., '15, Medical Corps.  
Hyde, George F., '15, Infantry.

Allen, Chester K., '16, Coast Artillery Corps.  
Haskell, Frank E., '16, Infantry.  
Hathaway, Charles E., Jr., '16, Infantry.  
Hemenway, Justin S., '16, Infantry.

Edwards, Franz G., '17, Infantry.  
Mack, Walter A., '17, Infantry.  
Ruppel, Arthur D., '17, Field Artillery.  
Swett, Francis S., '17, Coast Artillery Corps.  
Upson, Everett L., '17, Infantry.  
Williams, Arthur E., '17, Infantry.

Boaz, William H., '18, Infantry.  
Foster, Hamilton K., '18, Infantry.  
Goodridge, George L., '18, Infantry.  
Sampson, Frederick B., '18, Infantry.  
Weeks, Roger W., '18, Infantry.

Howe, James S., Unclassified, Infantry.  
Newton, Raymond L., Unclassified, Cavalry.

Gage, George E., Faculty, Medical Corps.  
McNutt, John C., Faculty, Medical Corps.  
Waugh, Frank A., Faculty, Sanitary Corps.

### *First Lieutenant*

Eddy, John R., '97, Infantry.  
Stearns, Harold E., '97, Veterinary Corps.  
Brooks, Philip W., '03, Field Artillery.  
Foster, Samuel C., '06, Engineers.  
Strain, Benjamin, '06, Engineers.  
Clark, Milford H., Jr., '07, Ordnance Department.  
Clementson, Lewis T., '07, Quartermaster Corps.

## M. A. C. IN THE WAR

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Hamburger, Amos F., '08, Infantry.  
Hutchings, Frank F., '08, Engineers.  
Sawyer, William F., '08, Infantry.  
Verbeck, Roland H., '08, Air Service.

Thayer, Robert E., '09, Ordnance Department.

Bailey, Dexter E., '10, Sanitary Corps.  
Brown, Louis C., '10, Engineers.  
French, Horace W., '10, Infantry.

Larabee, Edward A., '11, Infantry.  
Racicot, Phileas A., '11, Chemical Warfare Service.

Baker, Horace M., '12, Medical Department.  
Beers, Rowland T., '12, Infantry.  
Dodge, Albert W., '12, Infantry.  
Hiltbold, Werner, '12, Medical Reserve Corps.  
Stack, Herbert J., '12, Air Service.  
Tupper, George W., '12, Infantry.  
Williams, Silas, '12, Ordnance Department.

Barber, George W., '13, Cavalry.  
French, James D., '13, Infantry.  
Gore, Harold M., '13, Infantry.  
Hasey, Willard H., '13, Infantry.  
Headle, Marshall, '13, Air Service.  
Kelley, Albert J., '13, Infantry.  
Roehrs, Herman T., '13, Ordnance Department.

Baker, Melville, '14, Royal Flying Corps.  
Christie, Edward W., '14, Infantry.  
Clark, Ernest S., Jr., '14, Infantry.  
Foster, Stuart B., '14, Medical Department.  
Gibson, David W., '14, Infantry.  
Griffin, William G., '14, Medical Corps.  
Wheeler, Chester E., '14, Air Service.

Bartlett, Edward R., '15, Infantry.  
Bemis, Willard G., '15, Air Service.  
Clark, Arthur L., '15, Air Service.  
Flebut, Alpha J., '15, Infantry.

## M. A. C. IN THE WAR

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Komp, William H., '15, United States Public Health Service.  
Montague, Enos J., '15, Air Service.

Simon, Isaac B., '15, Infantry.

Smith, Francis A., '15, Infantry.

Tower, William R., '15, Coast Artillery Corps.

White, Harry D., '15, Infantry.

Carderelli, Emilio J., '16, Infantry.

Dinsmore, Donald S., '16, Field Artillery.

Huntington, Charles A., Jr., '16, Infantry.

Jenna, William W., '16, Infantry.

Montgomery, Thomas M., '16, Infantry.

Palmer, George B., '16, Infantry.

Rogers, Tyler S., '16, Quartermaster Corps.

Verbeck, Howard G., '16, Air Service.

Walker, Henry M., '16, Infantry.

Farwell, Alfred A., '17, Field Artillery.

Hagelstein, Charles H., '17, Coast Artillery Corps.

Harrington, Albert T., '17, Field Artillery.

Henderson, Elliott, '17, Infantry.

Nash, Herman B., '17, Infantry.

Saville, William, Jr., '17, Infantry.

Spaulding, Almon W., '17, Ambulance Service.

Squires, Paul R., '17, Field Artillery.

Tuthill, Samuel F., '17, Infantry.

Bainbridge, Frank, '18, Air Service.

Francis, Donald S., '18, Infantry.

Fraser, Charles A., '18, Infantry.

Gillette, Nathan W., '18, Field Artillery.

Holmes, Robert P., '18, Infantry.

McNaught, Warren H., '18, Field Artillery.

Mitchell, Edward N., '18, Infantry.

Odams, Lester N., '18, Infantry.

Powell, James C., '18, Infantry.

Reumann, Theodore H., '18, Infantry.

Richardson, Stephen M., '18, Infantry.

Rosequist, Birger R., '18, Infantry.

Spaulding, Lewis W., '18, Infantry.

## M. A. C. IN THE WAR

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Thompson, Wells N., '18, Infantry.  
Worthley, Harlan N., '18, Infantry.  
Desmond, Thomas W., '19, Infantry.  
O'Hara, Joseph E., '19, Infantry.  
Rowe, Clifford A., '19, Infantry.  
Sexton, Ernest F., '19, Infantry.  
Cande, Robert P., '20, Infantry.  
Mangum, Andrew B., '20, Medical Department.  
Wright, Kenneth Y., '20, Infantry.  
Hager, Joseph A., '21, Infantry.  
Fitzgerald, William P., Unclassified, Infantry.  
Kaulbach, Hugh A., Unclassified, Quartermaster Corps.

### *Second Lieutenant*

Peters, Frederick C., '07, Field Artillery.  
Summers, John N., '07, Tank Corps.  
Thomson, Jared B., '09, Infantry.  
Johnson, William C., '10, Sanitary Corps.  
Neilson, Gustaf A., '11, Air Service.  
Smith, Raymond G., '11, Infantry.  
Wood, Alton P., '11, Infantry.  
Curran, Daniel J., '12, Infantry.  
Lodge, Charles A., Jr., '12, Air Service.  
Philbrick, William E., '12, Field Artillery.  
Sanctuary, William C., '12, Signal Corps.  
Wilde, Earle I., '12, Quartermaster Corps.  
Dayton, James W., '13, Air Service.  
Forbush, Wallace C., '13, Infantry.  
Hyland, Harold W., '13, Infantry.  
Jordan, S. Miller, '13, Infantry.  
Lesure, John W. T., '13, Infantry.  
Miller, Harold H., '13, Coast Artillery Corps.  
Neal, Ralph T., '13, Infantry.  
Nichols, Norman J., '13, Infantry.  
Whitney, Francis W., '13, Infantry.

## M. A. C. IN THE WAR

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Bickford, Horace M., Jr., '14, Air Service.  
Black, Harold C., '14, Ordnance Department.  
Bradley, John W., '14, Air Service.  
Clay, Harold J., '14, Quartermaster Corps.  
Damon, Samuel R., '14, Field Artillery.  
Earle, Henry W., '14, Infantry.  
Edgerton, Almon M., '14, Field Artillery.  
Freeborn, Stanley B., '14, Medical Department.  
Major, Joseph, '14, Air Service.  
McNiff, Owen A., '14, Air Service.  
Munroe, Donald M., '14, Infantry.  
Powers, Richard H., '14, Coast Artillery Corps.  
Stevens, Arthur E., '14, Air Service.  
Tarbell, Munroe G., '14, Infantry.  
Tower, Alfred L., '14, Coast Artillery Corps.  
Whidden, Burton C., '14, Infantry.  
Whippen, Charles W., '14, Field Artillery.  
Wood, Henry J., '14, Infantry.

Alden, Charles H., '15, Infantry.  
Allen, F. Ellwood, '15, Medical Corps.  
Bishop, Chester A., '15, Infantry.  
Brooks, Gardner M., '15, Infantry.  
Cleveland, Waldo A., '15, Air Service.  
Dalrymple, Andrew C., '15, Field Artillery.  
Fuller, Richard, '15, Infantry.  
Griggs, Raymond B., '15, Infantry.  
Hawes, Clayton P., '15, Infantry.  
MacNeil, Ralph L., '15, Air Service.  
Melican, George D., '15, Air Service.  
Patterson, Robert E., '15, Air Service.  
Rhoades, Paul W., '15, Motor Transport Corps.  
Sears, William R., '15, Infantry.  
Tonry, Albert J., '15, Medical Corps.  
Wilkins, Alfred E., '15, Air Service.  
Williams, Donald, '15, Field Artillery.  
Aiken, Harold, '16, Infantry.  
Armstrong, James F., '16, Air Service.  
Barnes, Dwight F., '16, Air Service.

## M. A. C. IN THE WAR

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Curran, Harry A., '16, Infantry.  
Cushing, Raymond A., '16, Cavalry.  
Danforth, George N., '16, Field Artillery.  
Darling, Homer C., '16, Infantry.  
Dodge, Walter E., '16, Air Service.  
Doggett, William H., '16, Engineers.  
Edwards, Maurice M., '16, Infantry.  
Estes, Ralph C., '16, Infantry.  
Gilmore, Benjamin A., '16, Infantry.  
Hall, Stanley W., '16, Infantry.  
Hulsizer, Allan L., '16, Air Service.  
Linguist, Albert E., '16, Infantry.  
Mahan, Harold B., '16, Infantry.  
Maurer, Erwin E., '16, Air Service.  
Nicholson, James T., '16, Infantry.  
Potter, David, '16, Infantry.  
Prouty, Stanley M., '16, Infantry.  
Rich, Gilbert W., '16, Infantry.  
Richards, Everett S., '16, Infantry.  
Ryan, William E., Jr., '16, Infantry.  
Sander, Benjamin C. L., '16, Infantry.  
Schlotterbeck, Lewis, '16, Air Service.  
Sherinyan, S. Donald, '16, Field Artillery.  
Wilton, Carrick E., '16, Infantry.

Bell, Alfred W., Jr., '17, Field Artillery.  
Bonn, Wesley C., '17, Aviation.  
Borden, Raymond V., '17, Infantry.  
Buttrick, David Herbert, '17, Quartermaster Corps.  
Clark, Walter T., '17, Infantry.  
Dudley, Lofton L., '17, Infantry.  
Everbeck, George C., '17, Infantry.  
Fearing, Ralph W., '17, Infantry.  
Fisher, George B., '17, Infantry.  
Graham, Leland C., '17, Air Service.  
Henninger, Roswell H., '17, Air Service.  
Irving, William R., '17, Infantry.  
Kelsey, Edmund D., '17, Field Artillery.  
Latham, Paul W., '17, Air Service.



## M. A. C. IN THE WAR

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Livermore, William T., '17, Motor Transport Corps.  
McNamara, Michael J., '17, Infantry.  
Nims, Homer W., '17, Air Service.  
Picard, Walter D., '17, Coast Artillery Corps.  
Pierce, Harold B., '17, Infantry.  
Rorstrom, Hans A., '17, Infantry.  
Ross, Louis W., '17, Infantry.  
Saidel, Harry S., '17, Infantry.  
Sturtevant, Warner B., '17, Ordnance Department.  
Thayer, William W., '17, Infantry.  
Tucker, Lee H., '17, Infantry.  
Warren, Harold M., '17, Sanitary Corps.  
Westman, Robert C., '17, Infantry.  
Whitney, Joseph F., '17, Field Artillery.  
Wilber, Charles R., '17, Infantry.

Allen, Leland C., '18, Medical Department.  
Babbitt, Frank M., '18, Engineers.  
Baker, Foster K., '18, Air Service.  
Boyd, Robert L., '18, Infantry.  
Canlett, Franklin H., '18, Field Artillery.  
Carter, Thomas E., '18, Infantry.  
Chambers, Roger J., '18, Air Service.  
Chapman, John A., '18, Field Artillery.  
Edes, David O. N., '18, Infantry.  
Erickson, George E., '18, Infantry.  
Faneuf, Leo J., '18, Air Service.  
Farrar, Delwin B., '18, Air Service.  
Foley, William A., '18, Infantry.  
Gasser, Thomas J., '18, Infantry.  
Goodwin, William I., '18, Infantry.  
Grayson, Forrest, '18, Air Service.  
Hance, Forrest S., '18, Infantry.  
Harwood, Ralph W., '18, Infantry.  
Hawley, Robert D., '18, Infantry.  
Howe, George C., '18, Field Artillery.  
Hunnewell, Paul F., '18, Infantry.  
Huntoon, Douglas H., '18, Infantry.  
Kirkham, Philip L., '18, Chemical Warfare Service.

## M. A. C. IN THE WAR

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Lanphear, Marshall O., '18, Infantry.  
Lyons, Louis M., '18, Infantry.  
Maginnis, John J., '18, Infantry.  
Marshall, Max S., '18, Infantry.  
McClellan, Adams N., '18, Field Artillery.  
McKechnie, Donald, '18, Field Artillery.  
Minor, John B., Jr., '18, Infantry.  
Mower, Carlos T., '18, Infantry.  
Moynihan, Patrick J., '18, Infantry.  
Norcross, Gardner C., '18, Infantry.  
Pratt, Oliver G., '18, Infantry.  
Sawyer, Wesley S., '18, Infantry.  
Sawyer, William G., '18, Air Service.  
Stackpole, Frank C., '18, Air Service.  
Tilton, Arthur D., '18, Field Artillery.  
Willoughby, Raymond R., '18, Infantry.  
Woodworth, Brooks, '18, Infantry.

Baker, William H., Jr., '19, Infantry.  
Baxter, Herbert H., '19, Infantry.  
Beadle, Herbert O., '19, Field Artillery.  
Blanchard, George K., '19, Air Service.  
Bogholt, Carl M., '19, Infantry.  
Bowen, Arthur N., '19, Field Artillery.  
Boyce, Alan F., '19, Infantry.  
Boynton, Raymond W., '19, Infantry.  
Bradley, William G., '19, Air Service.  
Callanan, John E., '19, Field Artillery.  
Callanan, Vincent D., '19, Infantry.  
Carpenter, Hall B., '19, Infantry.  
Cassidy, Morton H., '19, Signal Corps.  
Coderre, Ernest L., '19, Infantry.  
Day, Harold R., '19, Infantry.  
Dickinson, Victor A., '19, Infantry.  
Farrington, Robert P., '19, Infantry.  
Faxon, Paul, '19, Infantry.  
Field, John B., '19, Air Service.  
Hunter, Harold, '19, Infantry.  
Mahon, John J., '19, Air Service.

## M. A. C. IN THE WAR

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Mansell, Elton J., '19, Infantry.  
Mattoon, Charles G., '19, Field Artillery.  
Morgan, Earl A., '19, Infantry.  
Morse, Maurice, '19, Infantry.  
Newbold, Douglas T., '19, Field Artillery.  
Parke, Robert W., '19, Field Artillery.  
Pierpont, Frederick T., '19, Signal Corps.  
Poole, Harold W., '19, Air Service.  
Quimby, Arthur E., '19, Field Artillery.  
Readio, Roger F., '19, Air Service.  
Record, Harold J., '19, Air Service.  
Roberts, Mark A., '19, Infantry.  
Sargent, Walter H., '19, Air Service.  
Schenkelberger, Frederic, '19, Field Artillery.  
Sedgwick, Alfred, '19, Air Service.  
Skinner, Everett H., '19, Infantry.  
Spaulding, Harold E., '19, Infantry.  
Strack, Edward, '19, Field Artillery.  
Sweeney, William J., '19, Infantry.  
Tirrell, Loring V., '19, Infantry.  
  
Armstrong, Philip B., '20, Infantry.  
Bigelow, Henry C., '20, Infantry.  
Crawford, John A., '20, Infantry.  
Crimmin, Royce B., '20, Air Service.  
Daggett, Clinton J., '20, Infantry.  
Dewing, Warren M., '20, Infantry.  
Graff, Leland S., '20, Infantry.  
Graves, Carlisle F., '20, Infantry.  
Gray, Irving E., '20, Air Service.  
Hathaway, Warren S., '20, Infantry.  
Hurd, Gordon K., '20, Infantry.  
Lambert, Richard B., '20, Infantry.  
Mangum, Andrew B., '20, Medical Department.  
Quadland, Howard P., '20, Infantry.  
Readio, Philip A., '20, Infantry.  
Roberts, Ivan A., '20, Air Service.  
Shattuck, Carl W., '20, Air Service.  
Smith, Fred G., '20, Air Service.

## M. A. C. IN THE WAR

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Snow, John D., '20, Air Service.  
Stiles, William B., '20, Infantry.  
Sullivan, Walter M., '20, Infantry.

Alexander, Ralph E., '21, Infantry.  
Cascio, Peter J., '21, Infantry.  
Galusha, Mark H., '21, Infantry.  
King, Starr M., '21, Infantry.  
Lacroix, Donald S., '21, Infantry.  
Mellen, Richard A., '21, Infantry.  
Miller, William H., '21, Field Artillery.  
Nuber, Ralph E., '21, Infantry.  
Palmer, Walter I., '21, Infantry.  
Thyberg, George J., '21, Field Artillery.  
Webster, Milton F., '21, Field Artillery.

Norcross, Harry C., '23, Infantry.

Cromack, Earl A., '24, Field Artillery.

Campbell, John C., Unclassified, Infantry.  
Crosby, Robert F., Unclassified, Infantry.  
Grundler, Adolph J., Unclassified, Infantry.  
Morse, Louis L., Unclassified, Signal Corps.  
Trider, George H., Unclassified, Air Service.  
Tuttle, George R., Unclassified, Ordnance Department.

Bales, Harold C., Graduate Student, Infantry.  
Payne, William T., Graduate Student, Sanitary Corps.

Hicks, Curry S., Faculty, Infantry.  
Kilham, Austin D., Faculty, Infantry.  
Smith, John B., Faculty, Sanitary Corps.

### *Lieutenant (Rank not specified)*

Mellon, Ralph R., '14, Infantry.

Nash, Clayton W., '16, Infantry.

Hartford, Claude E., '17, Signal Corps.  
Lydiard, Harry C., '17, Air Service.

## M. A. C. IN THE WAR

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Edwards, Millet, '18.

Kennedy, Carl F., '18, Air Service.

Davies, Ernest L., Graduate Student.

### Navy

#### *Rear Admiral*

Barber, George H., '85, Medical Corps.

#### *Major*

Racicot, Arthur C., '06, Marine Corps.

#### *Captain*

Randall, Earle M., '17, Marine Corps.

#### *Lieutenant*

Tinker, Clifford A., '03, Naval Aviation.

Shaw, Ezra I., '12, Marine Corps.

Hubbard, Roswell E., '13, Naval Reserve Force.

Rose, Stephen D., '13, Naval Reserve Force.

Morse, Harold J., '14, Naval Reserve Force.

Buttrick, John W., '15, Naval Reserve Force.

Houghton, Arthur R., '15, Naval Reserve Flying Corps.

Saben, Maxwell B., '15, Naval Reserve Force.

Shumway, Paul E., '17, Naval Aviation.

Smith, Hayden H., '17, Naval Reserve Force.

Allen, Ralph E., '18, Naval Reserve Force.

Kimball, William L., '19, Naval Reserve Force.

Woodworth, Leverett S., '23, Naval Reserve Force.

Phillips, Arthur W., Graduate Student, Naval Reserve Force.

### *Ensign*

Eldridge, Harold L., '14, Naval Reserve Force.

Hadfield, Harold F., '14, Naval Aviation.

Jacobs, Loring H., '14, Naval Aviation.

## M. A. C. IN THE WAR

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Bredemeier, Carl L., '15, Naval Reserve Force.

Hathaway, Isaac, '15, Naval Reserve Force.

Slein, Owen F., '15, Naval Reserve Force.

Barnes, Fred L., '16, Naval Reserve Force.

Fernald, Charles H., '16, Naval Reserve Force.

Harriman, Chester K., '16, Naval Reserve Force.

King, Edward L., '16, Naval Reserve Force.

Scheufele, Frank J., '16, Naval Reserve Force.

Boles, Robert S., '17, Naval Reserve Force.

Curtin, Charles W., '17, Naval Reserve Force.

Goldstein, Maurice, '17, Hospital Corps, Naval Reserve Force.

Gurshin, Carl A., '17, Medical Corps, Naval Reserve Force.

Light, Brooks, '17, Naval Reserve Force.

Buchanan, Walter G., '18, Naval Aviation.

Davis, Dwight S., '18, Naval Aviation.

Patch, Lawrence E., '18, Hospital Corps, Naval Reserve Force.

Wilbur, Lawrence W., '18, Naval Reserve Force.

Edmonds, Reginald W., '19, Naval Aviation.

Jordan, Raymond D., '19, Naval Aviation.

Knight, Frank E., '19, Naval Reserve Force.

Martin, Andrew L., '19, Naval Reserve Force.

Peterson, Roy D., '19, Naval Reserve Force.

Ratner, Charles C., '19, Naval Reserve Force.

Dwyer, James E., '20, Naval Reserve Force.

MacCormack, Ralph R., '20, Naval Aviation.

Vinten, C. Raymond, '21, Naval Reserve Force.

Bronson, Wesley H., Faculty, Naval Reserve Force.

Hazeltine, Burt A., Faculty, Naval Reserve Force.

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LETTERS, ADDRESSES, AND  
OTHER MEMORANDA

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# LETTERS, ADDRESSES, AND OTHER MEMORANDA

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LETTER FROM LIEUTENANT LOUIS W. ROSS, 1917, ABOUT  
JANUARY 1, 1918

The life of a soldier in France is to be envied, in some ways, because he has the chance, which is available to so few so far, to be a participant in, and to see the operations and existing conditions both in and behind the lines of, a fiendish and unparalleled war and a war-ridden country. He sees the terrible physical results of previous offensives due to gas, fire, shell-fire, shrapnel, bullets and many other death-dealing materials; he sees the endless procession of supplies and materials constantly pouring into the trenches from the rear (everywhere are storehouses for such); and he sees the numberless privations and shortages that the people of the country have to endure. But, on the other hand, are hardships that one must pass there in order to be a participant.

Naturally you wonder what the hardships could be — not hardships to us, for we are used to them, but hardships to all those in the States. We have no steam-heated barracks, no large drill and parade ground, no visitors or short vacations, no concerts or movies. We live in barns with porous roofs and dirt floors, with but three blankets, some straw, and no pillows, and this in the dead of winter, a foot of snow, and below zero. Some places the men build stoves with bricks, but there is no smoke outlet except the roof — then, again, wood is almost impossible to get. Two of my men sleep in an immense beer barrel; two others sleep in an empty stall between the horses and cows in one of the barns. You may not believe it, but it is so. But I must say the American soldier is the most ingenious fellow on earth when it comes to making himself comfortable. You can fool him once, but he is ready the next time. I am reminded of an example of this which occurred on a train.

The men were in box cars labeled "10 cheveaux et 40 hommes," and experienced a very cold night of it, but the next night they had stoves made of stones they picked up during stops, plenty of wood, and coffee boiling in tin cans. We billeted in little dirty French towns, terribly neglected from lack of men to keep them up. These towns, you know, are continuous buildings in a group, with good roads but no houses between towns. This town where I am is entirely secluded in a little valley some distance from a railroad. There are never any visitors, only the couple hundred French people who live here. Any town we stop in for any length of time we must clean up. With the jacks of all trades in the company we have fixed the town clock, made shower baths, constructed a sewerage system, repaired buildings and broken windows; in fact, we have either mended or cleaned up everything, whether the townspeople liked it or not.

In order to show what things all the men over here must do, I will try to describe a ninety-mile march we made to this village in the dead of winter. We made this march in a foot of snow, it snowing every one of the seven days (sometimes it was hard to find the road) and the thermometer below freezing all the time. The men were carrying 50-pound packs and a rifle, some without even socks and gloves. At night, having nothing but barns to stop in, their shoes would freeze hard, and it was necessary to burn straw in them in order to get them on again, and then some would burn the soles out, thereby necessitating walking in practically bare feet — they had to do it. Some wrapped gunny sacks on their feet because shoes were impossible to get on; others did not dare to take their shoes off during the whole march, having to sleep in wet shoes. At night they often just refused to eat on account of being so tired; other times the green wood would not burn, therefore nothing to eat anyway. Whenever we did eat, the beef quarters and bread had to be cut with an axe because of being frozen hard. The last day was terrific, the coldest of all, and as we came through a blizzard along the last long stretch of flat country to this little valley, which we came upon suddenly through a little wood, the men were about ready to give up; exhaustion prevailed. As for myself, I had to carry two packs

and a man on my back the last half mile, and it took just two hours to do it. And through it all never a complaint was uttered. The men took it and said nothing, — it had to be done. These are the sort of men who are over here fighting and taking everything as it comes. It is the same with all of them. For my own men, they sure are a cocky, Hun-thirsty bunch of wildcats, waiting to be unchained. They are a cursing, rip-roaring, God-fearing bunch, afraid of nothing on earth. When they go through bayonet drill they are maniacs, their growling and cursing as they stick the dummies will make any Heiny's liver curl up.

We have all read more or less about the trenches, but you will be surprised to know that they are not as one imagines — they cannot be described, really; one has to go there and be under shell-fire to appreciate life in the trenches. You will be surprised to know that one fears nothing when going into them; the fear comes when one is ready to go out. I spent a stretch of time in them, and that was my experience. Of course the trenches are full of mud and water in the winter, and one has to drop face down in it whenever a shell bursts near by, but that is nothing. One really is not in constant fear of getting hit with anything. It is the last thought — no one can understand how he would get nicked. I suppose it is the same with all the rest, but when I heard a shell going by with that evil swishing noise I just laughed with joy that it did not stop for a visit — and they do not stop very often except on Christmas or New Year's. I had the pleasure of having my Christmas dinner in a dugout under the ground about forty feet. We had beef, carrots, potatoes, plum pudding and beer for our meal, — a regular spread. The dugout was, of course, damp, and the walls were wet, but there was a fireplace. In one corner was a deep well for the water to drain into, and along the walls were bunks quite convenient to rat holes. The well was also used to throw the rats into after killing them. Rats are the real enemies in the trenches, not their brothers, the Heiny's. A trench club is always necessary, and is usually kept very active, especially at night when trying to sleep. Yes, the trenches are not so bad; we have beautiful fireworks at night, aeroplane combats occasionally during the

day, and we have much fun dodging the "flying pigs," — big loping shells that come high and slow, and easily seen, but very dangerous. The American soldier, — do not call us Sammies, — with his helmet cocked on the side, has fun in this way, and laughs with glee when a shell lands near or a sniper has picked off a big fat target.

And so it all goes. We work hard all day. An officer sleeps at night if he can. Every one looks forward to going home some day, but not till this is all over; and to finish it all the sooner, constant work prevails. There are no band concerts, no dress parades — just work, eat and sleep, day in and day out, getting ready for the big show, with each day being one nearer home. All we know, think and dream is grenades, machine guns, auto-rifles, V. B's., trench mortars and bayonets, but we do not give a damn — Heiny is the one to worry. To end up with, perhaps you would like to hear one of my own experiences, most vivid to me because it was my first. One night I crept out on No Man's Land with an experienced officer of another army, who knew the ropes. It was a pitch black night, — the reason why we went out. We were in a shell hole in front of our wire, having crawled out there very, very quietly and slowly. Laying on the other side of the shell hole, with our heads above the top, we were peering over the land without seeing a thing until a flare lit up the surrounding country. The light revealed directly in front of my friend the head of a German looking out of another hole a few feet away, and without a bit of hesitation, before I could even believe my eyes, my friend just threw his rifle, bayonet first, at the head, and all I heard was a guttural gurgle, and I ran — or crawled as fast as I could, rather — back to where we came from. I had had enough for the first time. My friend only laughed at me, and said that was nothing but a common occurrence every night.

## M. A. C. IN THE WAR

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### LETTER FROM FRED MATHER, 1917

WITH THE CANADIAN FORCES,  
BOSINGSTOKE, ENG., December 18, 1917.

I have received six numbers of the "Collegian" through November 20, and was almighty pleased. Davies certainly did have a treacherous death, and the German officer got what he deserved.

I have had a medical examination and was placed in category B III. All soldiers are in a certain category of classification. Fighters in France are all A I. B III is the lowest, and is next to either a discharge or return to Canada. Members of B III are sent to Canada to do various kinds of military work there, perhaps to replace fit men for the front. I may get sent back to Canada or maybe not. A man who gets in the habit of expecting things sometimes gets disappointed. I expected to be placed in category D I. D is lower than B in the alphabet, but D classification means a training extending from six weeks to six months to fit men for the firing line. I became better sooner than I expected, so am well pleased. I may come back to Canada yet. I will get twelve days' leave before returning to my depot where I went when we first came to England, over fifteen months ago.

When I am in London I am going to try and arrange for my transfer into the U. S. Army. I am a little bit damaged, and they may refuse to take me, but I think they should be willing to take one of their citizens. If I am refused, there is a demand for men B category to take up typewriting and general stenography work in a military school to replace A men for active service in the army.

I had some discomfort when I was wounded, but it is all over with, and I think nothing of it. We have concerts once a week at this hospital. One thing I dread about leaving is that I leave a steam-heated building to go into wooden huts heated by two small stoves, with a heating circle around them of about five feet radius. There are more than enough fellows in a hut to fill up that radius too. Also shaving outside with cold water. It makes me shiver to think about it. The baths are arranged so that water can easily run out and wind as

easily come in. Hot water is provided, but we must run some into a pan and pour it into a small tank above our heads to run down on us through a lot of holes, an arrangement like the top of a watering pot — never mind, spring will be here. I always think how lucky I am compared to the poor fellows in the trenches. The Germans must be beaten, and we can stand a few discomforts. Many men have made the great sacrifice, and we have no cause to complain.

It is interesting to read the letters from the fellows in the army which were printed in the "Collegian." Some have made good and seem content; others, not so well off, are beginning to complain, but that is as far as it goes, and we think nothing of it after it is over.

### FROM LETTERS OF FRED L. BARNES, 1916

*At the Navy Yard, Brest.* — I have just returned from a mile hike this Sunday afternoon along the quay and about the city. The quay offers a fine outlook over the harbor, where a large fleet of tramps and freighters lie waiting for convoys. Away off across the harbor the country is of a rolling type, and fades away into the beyond with changing shades of light blue. Here and there a cluster of houses denote a hamlet or village, between which the green fields are distinctly bounded by stone walls. The remains of old castles rear themselves as an occasional landmark, and with their probable histories are in themselves well in keeping with the spacious territories they command.

*On Watch.* — A full moon last night made the night almost a day. Our mooring place, in a river lined with all kinds of war craft and navy building, presents a picture when in combination with the moonlight, — lights twinkling all about, many of them searchlights, the constant rumble of near-by machinery manufacturing shells for the front, ahead of us a large British freighter taking aboard a big cargo of ammunition and aeroplanes securely crated, and on which work is carried on all night as well as days. Now and then the shriek of a harbor boat or one of the miniature Navy Yard engines breaks the silence. The air here is chilly, especially so when the

English fogs creep in about 4.30 every morning, wetting everything unprotected. At exactly 5 A.M. sounds the French reveille on board various men-of-war, and the call is taken up all along the line. Crews begin to emerge sleepy-eyed from below decks to get their morning coffee; 5.15 sees large gangs of Austrians, Turks, and Algerians, some of them prisoners, hurrying to their various activities and accompanied by armed French soldiers. Then comes deck-swabbing and the before-breakfast duties.

*Two Days before Christmas.* — It is after 9 P.M. now, and 9.30 will see everything in darkness. To-day we have been out sweeping a really truly reported mine-field — cold work, too, it was, for the temperature stood just above freezing while we got overboard the gear, and ice was a quarter of an inch thick on deck. The bay was rough, and old boreas just picked off the top of those dark green frigid-looking waves and threw it over the afterdeck where we were working, in a cloud of spray. We are forbidden to use big coats or gloves when working at this, and my hands were too numb to grasp even the boathook. Life belts over working dungarees are our only cold-protection, for if we get overboard the least clothing on the better, and the assigned part that I have makes it necessary to all but get overboard every time we haul in the gear.

*Christmas Eve.* — I am writing this now while we are at anchor at our new base. Last night, the ship's lights being shut off, prevented my writing much. To-day we have been out and swept a mine-field again. We steamed into this port at 5 P.M., and tied alongside two other boats the same as ourselves. I can hardly realize that it is Christmas Eve, the only two evidences of this being a spruce tree on the afterdeck of the boat alongside, and the many different-toned church bells, whose clear tones are coming out across the water. No wind is in motion, and a slight mist hangs about. The water is limpid with bright rippling reflections of ship's lights, beacons and the naval building of the town gardens. Two of us have just returned from a trip to the flagship with our skipper, and it was really a pleasure to row about on such a night. In contrast to the 10 degrees above temperature you mentioned, the air was very comfortable.

*Later.* — Let me ask a question. Is public opinion at all concerned with the American sailors in these foreign waters? All we sailors hear is "the Sammies, and our American soldiers." We have never had any tobacco given to us, or the other charitable donations which have reached soldiers' hands. The papers are full of Sammies' doings, but nothing at all about the "chaps afloat." Surely, I do not feel hurt, for I have received as many Christmas things as any soldier, but I'm speaking for the general run of sailors. A recent remark made by Colonel Roosevelt interested me. Teddy said, "If I had my way, every American slacker would be put aboard a mine sweeper in European waters where he would see *real service*." That is indicative of the fact that we are "doing things," anyway. From my point of view, I do not give a darn about paper write-ups or medals or credit of any kind. My hopes are on the end of the war.

As a grand finale of that day we came within a shade of firing on a large submarine. The U boat was German (captured), but manned by a French crew. A heavy fog made her recognition very difficult, and it was only her allied recognition blinker signals that saved her. This life is one of surprises and constant alertness. At all times when at sea we wear life belts, and a lookout is stationed at the masthead. As little clothing as possible is worn in case of getting overboard, and watches (not Ingersolls) stand at bow and stern.

A few words concerning our mine-sweeping. As to gear we use I will reserve this information until after the war. Our active daily duties take place from two hours previous to high tide until two hours after; for this reason, German mines are set at depths varying from 15 to 25 feet below the surface (at high water). Consequently, after a 7 to 12 drop in tidal feet it is rather foolhardy work, playing around these mines when your vessel draws anywhere from 10 to 15 feet. Mine fields are usually reported by hydroplane or dirigible observers, or are *felt* after the destruction of a number of ships in that proximity. You see by the tidal calendar that we have six or seven days' sweeping, and then are in port for three or four days waiting for the tide to come right. Our place of work seldom extends more than five miles off shore — the pathway and



channels taken by the large convoyed steamships going up or down the coast. As a rule, we work in fairly rough water, as the Bay of Biscay can scarcely be titled "pacific." However, we have been forced to return to port on account of too heavy seas. Further details are "out of style" just now.

Mine-sweepers have been known to sweep a course and have a U boat just astern, laying mines as fast as they were removed. This was easy, as the sub. was working far below the surface all the time, and therefore invisible. Just think how many death-dealing inventions this war has brought forth. All this is not play, by any means, and accompanied by very little warmth these days.

Now as I write our flagship is steaming in, so in hopes of some mail from home I will make an end to this letter.

It is Sunday afternoon, and as our old bun of a skipper has restricted me for this coming week aboard ship I will have more time for letters. I was told my mattress cover was dirty and thus the restriction. It was my own fault, for I should have known enough to turn that mattress cover inside out before the old man came below on his tour of inspection. [Pause.] Now I can write better, for Rip Converse has just given me a big cigar, and it tastes good just after a dinner of fricasseed rabbit. Did you ever eat that species of bird? As I write now our boat is surging back and forth to the tune of a 25-mile southeaster and its accompanying waves. Every second — whang! We bump against another of our fleet moored alongside, so pardon any jolts you receive in this letter, won't you?

Had not fate played against me, I would have had one fine time this afternoon. Last Wednesday we had just been paid off with paymaster's checks, and for these we had to receive French money ashore. Barnsie goes ashore at 4.30 that afternoon with a borrowed peacoat and some one else's shoes. Could not find my own, for some one else could not find theirs. Once ashore I was unable to locate the exchange bank there, and while wandering about ran across a French soldier. Casually asked him where the bank was and he kindly showed me. While we walked about we improved the time by getting better acquainted. After getting my French money I suggested that we get some supper, so we did, and here is a rather

## M. A. C. IN THE WAR

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curious fact. When a gob goes out alone, or in the company of other American sailors, everything costs like time. With Frenchmen along as companions one pays scarcely anything. I was surprised at the bill handed me. For two orders of beefsteak with French fried, butter, bread, cheese and a bottle of vin rouge I handed over 40 cents in American money. That evening until 9 o'clock we wandered about, and while I told him American names for everything, he (speaking fairly good English) did the same for me in French. This chap who has been three and one-half years in the front-line trenches, and was on a ten-day furlough home, told me many interesting facts about the war. He was at Verdun and at the Marne. When asked about the American troops, etc., he said he did not expect to see them in the trenches much of any before the end of the war, and that his idea was that American money and diplomacy would do more toward bringing the war to a close than her soldiers would. Before we left each other that evening he kept urging that I meet him again before his furlough was up and go outside the city to his home. I agreed and set to-day at 2 P.M. Thus it was that I wanted to get ashore especially to-day and could not. I have his address at the front, and shall write him. Had I gone I would have met his people, and, besides, had a place where after this I could go once in a while when on liberty. To know a few people over here like that and have a shore *home* would mean so much and help break up this monotonous life.

### FROM LETTER OF C. E. CHOATE, 1917

FRANCE, October 17, 1918.

Have been over the top with the first American-manned tanks to go into action. At St. Mihiel we met very little resistance, but at Verdun we saw the very hardest sort of fighting. Our adventures were thrilling and our losses great. I had three tanks put out of action and was with a fourth when I got mine, — a slight bullet wound in the arm and gassed. One tank I drove was put out of action by a 77 fired point blank from under a Red Cross tent over which a Red Cross flag still flew. I hope to be killing Germans again in a few weeks. Best regards to M. A. C.

## M. A. C. IN THE WAR

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LETTER FROM JAMES A. PURINGTON, GRADUATE STUDENT

*Graphic Story of "Tuscania" Tragedy*

ON ACTIVE SERVICE WITH AMERICAN EXPEDITIONARY FORCE,  
SOMEWHERE IN ENGLAND.

The first part of my trip over was enjoyable in that I was not seasick. The waves ran high at times, even coming over deck and giving some good duckings. Some days the waves rolled up as huge mountains, bursting at the top with a white crest, just like a snow-capped peak. These would toss and bob us about like a top out of balance.

Then came the thrilling part of the trip, all of which, I understand, is well known in America. Each had his story varied in nature, but being a representative of M. A. C., possibly my story may be of interest. This I can best tell by quoting the following article published in one of the papers — somewhere: —

"A graphic account of the torpedoing of the troopship was given by James Alson Purington, a university graduate of New Hampshire (graduate assistant at the Massachusetts Agricultural College), serving with the 20th Regiment of Foresters. Private Purington said that he was on the upper deck when a torpedo struck them on the starboard. There was a terrific explosion and the steamer took on a great list. He made his way to the stairs to get to his boat station, but was stopped by the life-saving crew, who immediately came to their stations. With the explosion, the dynamo was blown up and the lights failed, but almost at once the auxiliary lighting plant, worked by another engine, was put into operation, and flares were lit on every deck. In the first darkness that succeeded the explosion there was some difficulty in lowering the lifeboats, chains being broken and tackle getting tangled. One or two boats capsized, and the occupants struggling in the water added to the confusion and tragedy. Private Purington ultimately got into a boat with about 40 others, but in being lowered it was half filled with water, and in a short time all had perforce to jump out. Fortunately for himself, Purington managed to clutch a couple of oars lashed together after he had floated for some time, and later he also secured a

plank that in comparison seemed to promise safety. For nearly three hours he managed to keep afloat until picked up by a mine-sweeper, but confesses that when the welcome boat appeared on the scene he was 'nearly all in.' He had nothing but praise for the treatment on the rescue boat, where plenty of blankets and hot drinks soon drove out the terrible cramps that had tormented him during the last part of his stay in the icy cold water. His rescuers informed him that there were many dead bodies floating around, but he himself was not conscious of very much during the latter part of the immersion."

Before the disaster I stood on the deck for some time enjoying the sunset over the water. A finer one I had never seen. Then I little realized that shortly the Huns would (as many times elsewhere) spoil such a peaceful time, the end of a perfect day. When the explosion came I was talking with a friend from Springfield whose father has a store there. By aid of his searchlight we proceeded over the watery deck to our places.

Well, take it from one who knows, there were many prayers that night. I was strangled a "wee bit" more than once, and sure felt my prayer was answered when the oars and especially the plank came. I had no fear for myself, personally, for I feel prepared any day if my time is due. My only thoughts during those moments were of the folks at home and how they would take it.

I cannot say too much in favor of the Red Cross and the work of the Y. M. C. A. Few people outside of the soldiers, I suppose, hardly appreciate their value.

FROM A LETTER TO MR. BULL, FATHER OF CAPTAIN BULL,  
COMMANDING OFFICER OF COMPANY G, 306TH INFANTRY,  
WITH WHICH EDWIN P. COOLEY, 1919, WAS SERVING  
WHEN HE WAS KILLED

The Germans held a hill, which was the key position, behind the town of Bazoches, and opposite St. Thibaut, on our side of the river. This hill—the shape of a natural fortress—

presented so formidable a front, and was so well protected on the flanks, that to attack it meant a fearfully high casualty list, and for several weeks our men held the line there along the river. They were entrenched in every available place behind hills and knolls, in woods and concealed in dugouts in and around St. Thibaut. Under these circumstances a raid was planned against the town of Bazoches, and Company G of the 306th was selected to put it through successfully.

I have never known whether the object of the raid was to capture the town and try to hold it, or whether it was simply to capture prisoners and test out the strength of the enemy in the town; for there was much discussion as to the number of men the Germans had placed in that strong position.

This raid was to be protected by a barrage of machine-gun fire, not from the guns in the front line, lest they betray their position, but by the guns placed back in the hills, using the indirect fire. I knew about this from one of the officers of the Machine Gun Battalion.

This barrage lasted for nearly two hours, and made things so hot in the town that the soldiers of the company selected — Company G under Captain Bull — were able to get over the bridge and up into the town pretty much unmolested. They went far up into the town, throwing hand grenades into cellars and dugouts and made prisoners. So far the raid was a great success.

At this time the barrage lifted and stopped — almost as suddenly as it had begun, and the Germans came out of their entrenchments in overwhelming numbers. Reserves came from the right side of the hill which had not been reached by the barrage, and the company was forced to retreat out of the town in the face of the numbers, and what was worse, under heavy fire. They came back, so an eyewitness told me, with their face to the enemy every step of the way, giving ground slowly and only under pressure. Of course they lost the prisoners taken, and many of the company were taken prisoners themselves.

It was thought at first that Captain Bull was himself killed or missing, but fortunately this was not the case. He brought them through in splendid shape, and displayed coolness and

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courage under the most trying circumstances. I heard it stated that seventeen of the company returned, but whether these figures are correct or not I cannot say positively.

### LETTER FROM J. H. GANDIER

The following statement is concerning Lieut. Ernest L. Davies, graduate assistant at the Massachusetts Agricultural College in 1913-14. As soon as England entered the war he enlisted with the Canadian Forces, and was killed in France October 21, 1916:—

ONTARIO AGRICULTURAL COLLEGE,  
GUELPH, CAN., May 7, 1917.

It seems strange that the only two men who, up to the present, have gone to the front from your institution should meet their death there. I expect you noticed by the list which I forwarded that E. L. Davies had been killed. It might be of some interest to you to know that this occurred in a most treacherous way. Davies was in charge of a detachment in the capture of the famous Regina trench. He was rounding up a bunch of prisoners, and was about to search a German officer who had his hands up, when he was shot a number of times in the head with a small automatic pistol which the German had concealed in his hand. The men who were with Davies kicked the German to death. It is acts such as this which make the war perhaps a good deal more bitter than it otherwise might be. I thought it might be of some interest to you to know just how Davies met his death.

### LETTER FROM CAPT. JOSEPH W. G. STEPHENS, COMPANY E, 26TH INFANTRY, RELATIVE TO LIEUTENANT WILLARD H. HASEY, 1913, KILLED IN ACTION JULY 19, 1918

OCTOBER 31, 1918.

I was wounded on July 19 and evacuated to a hospital where I have been ever since, and due to the fact that my division has been continually on the move since then, I have been unable to get any of my letters through to it.

When I was wounded Hasey was still in action. We were

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making an attack, and of course the line passed on and left me. The next night on the hospital train one of my men told me that Lieutenant Hasey had been killed by a high explosive shell while consolidating our newly captured position. He said, also, that he was buried on the field by the men of the company and his grave marked. At the time of his death he was in command of the company. Other than this very meager information I am sorry to have to say that I know nothing, and try as I have done to find out more, I have met with no success. There is no one left to tell me anything. Those who are not dead are scattered in various hospitals all over France, and it grieves me to say that they are not many in number. They are all gone; the poor company is now merely a name to me because all of the old men, with whom we worked and suffered, have paid the price in one way or another.

I learned that Hasey and his sergeant (Rutermann) were both recommended for the French decoration, but which one I do not know. I certainly hope that it was awarded, because he surely deserved it. To give you an idea of the nature of the attack in which we took part, the colonel, lieutenant-colonel, two majors, seven captains, and about twenty lieutenants were killed in three days.

COPY OF GERMAN PROPAGANDA FOUND NEAR FONTAINE BY  
CORPORAL H. W. HEADLE, 1913, COMPANY E, 23D  
ENGINEERS, A. E. F.

### *How to Stop the War.*

Do your part to put a stop to the war. Put an end to your part of it. *Stop fighting!* That is the simplest way. You can do it, you soldiers — just stop fighting and the war will stop of its own accord. You are not fighting for anything, anyway. What does it matter to you who owns Metz or Strassbourg? You never saw those towns or knew the people in them, so what do you care about them? But there is a *little town back home in little old United States* you would like to see, and if you keep on fighting here in the hope of getting a look at those old German fortresses you may never see home again.

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The only way to stop the war is to stop fighting. That is easy. Just quit it and slip across No Man's Land and join the bunch that is taking it easy there waiting to be exchanged and taken home. There is no disgrace in that. That bunch of American prisoners will be welcomed just as warmly as you who stick it out in these infernal trenches. Get wise and get over the top.

There is nothing in the glory of keeping up the war. But think of the increasing taxes you will have to pay. The longer the war lasts the larger these taxes at home will be. Get wise and get over.

All the fine words about glory are tommy rot. You have not got any business fighting in France. You would better be fighting the money trust at home instead of fighting your fellow soldiers in gray over here where it does not really matter two sticks to you how the war goes.

Your country needs you; your family needs you; and you need your life for something better than being gassed, shot at, deafened by cannon shots and rendered unfit physically by the miserable life you must live here.

The tales they tell you of the cruelties of German prison camps are fairy tales. Of course you may not like being a prisoner of war, but anything is better than this infernal place, with no hope of escape except by being wounded, after which you will only be sent back for another hole in your body. Wake up and stop the war. You can if you want to. Your government does not mean to stop the war for years to come, and the years are going to be long and dreary. *You better come over while the going is good.*



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### A SOLDIER'S THOUGHTS

To-day I am safe in the barracks,  
And the fight seems far away;  
A fire burns, and it's warm here;  
The morning is bright and gay.  
Last night I was out in a Hades  
Watching the star shells shine,  
And hearing the whine of the bullets —  
Two kilos away from the line.  
Around was a horrible blackness,  
Here only mud and grime;  
The autos all full of the wounded  
Dipped and slid through the slime.  
And each single man on those autos  
More of a man than I,  
For they seemed almost happy  
Some though about to die.  
But, watching, my fears all left me,  
These men were calm — why not I?  
I know that I must die some time,  
And, if it be I die here,  
May I go to my death a-smiling  
Like a Frenchman — without any fear.

— PRIVATE FREDERICK V. WAUGH, 1920,  
*Section 39, United States Army Ambulance Service.*

OCTOBER 21, 1917.

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### LADS OF THE KHAKI RETURNING

*(To the memory of Lieutenant Robert C. Westman of Massachusetts,  
killed in action August 10, 1918.)*

You tell me the war is soon over,  
That Hunland has crumbled down  
And peace in triumphant advances  
Has won through each flaming town.  
I greet you, Rejoicer, with gladness,  
Yet mine is the harder fate.  
For peace with her banners and bugles  
Has come to me too late.

In a grave on the Lorraine sector  
Where I cannot know even the place  
Lies quiet a torn young body,  
My lad of the shining face.  
He rose in the hour of our anguish  
With his eyes on the ultimate star;  
Now never again may I greet him,  
He has wandered so far.

O honor and beauty and splendor  
Of manhood as clean as the wind,  
O hands that were hearty to welcome,  
O Roland whose trumpet was thinned,  
Who blew in the beleaguered passes  
The horn of our desperate chance,  
Whose faith and whose body were white as  
The lilies of France!

The lads of the khaki returning  
March down the long lanes of the flag,  
And some of their coatsleeves are empty,  
And some are on crutches that drag;  
They are back to the home of their fathers,  
They have stormed the battalions of Hate, —  
Yet one face of gay laughter is absent  
Peace, you are late, you are late!

— PRIVATE WILLARD WATTLES,  
*Brigade Surgeon's Office,  
164th Depot Brigade, Camp Funston, Kansas.*

## ADDRESSES

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### ADDRESS TO THE CLASS OF 1917, AT THEIR COMMENCEMENT EXERCISES, BY PRESIDENT KENYON L. BUTTERFIELD

Never before in the history of M. A. C. has a college year closed under such extraordinary circumstances. The usual Commencement festivities are completely broken up. The exercise of conferring of degrees has been reduced to the very simplest forms. The Fiftieth Anniversary of the College, on the plans for which we have expended so much time and thought, an event to which we were looking forward with such keen zest, has been indefinitely postponed. The normal activities of the campus were suspended weeks ago. Practically the entire staff is giving full time to various phases of war work. The undergraduate students are largely engaged in farm labor, doing their part for the men who are to be at the front. The old campus is here, and never looked more beautiful to the eye; the buildings are little changed from what they were a year ago; but the institution has been completely reorganized in its activities, and possibly vastly changed in its spirit and outlook.

All these facts must come home with peculiar force to those members of the Class of 1917 who are with us to-night, as we assemble once more under the banners of the College, and equally, perhaps, to those members of the class who are unable to be present with us in body, but undoubtedly are thinking of this gathering and what it means to them. Some of your number are under military discipline and education, preparing for the call to go to the front that may come at any time. Many of you are in agricultural service of some sort. Few of you are doing what you had planned to do three months ago. And when we stop to think of the cause of it all, the proceeding seems not only unusual but tragic. The consciousness that

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our country has plunged into the great World War, and the growing realization that an epoch-making period in the world's history is upon us, in which we, as American citizens, are to play an unwished-for but most vital part, makes the occasion most solemn.

At first thought all this seems like entire misfortune. Your plans are broken up. You are called upon to make many sacrifices. Some of you and your parents have endured much that you might prepare yourselves in this College for a life work. Temporarily, at least, you have had to throw all these advantages overboard. You have had to engage in occupations that possibly are not wholly congenial, and in surroundings that you would not ordinarily choose. Some of you have consented to face the possibility of the supreme sacrifice. The face of the world has changed for you in these few weeks, and the future is uncertain.

And yet I know you realize that you are, nevertheless, going out into an unusual opportunity, — an opportunity for rare service to your country; an opportunity to justify magnificently the training which the College has given you; perhaps the opportunity to carry her name and fame abroad. So, while we wish that this catastrophe and these changes could have been avoided, we accept the situation, forget the disappointments, and throw ourselves unreservedly into the work that faces us, for we are pledged to do our part; we are compelled to make good; we are convinced that each of us must fit into the call of the times as best we can. We know that no one of us can do the work of some one else, and no one else can do quite the work each of us can do best. It is for us to find our places and to do our full duty, in order that it may be said of us that —

Yielding ourselves to the masterhand,  
Each in his part as best he could,  
We played it through as the author planned.

We are not in this war because we wanted to be. Not only did we not wish war, nor will war, but most of us have a hatred and even a horror of the dogs of war and all their hellish brood. I think, as we look back on the history of our country for the past three years, that we recognize the marvelous patience

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with which we endured injustice and even insult and plotting within our borders. We trusted that this patience might bring consideration and fair dealing. Many of our people felt at first that the war was none of our concern. To most of us it seemed remote and far away. After a while, we came to see not only that our honor was at stake, but that our future was menaced. Most of us believe to the full that the cause of the Allies has become our cause. And at last we begin to appreciate that nothing less than the world's freedom is the issue. Many of us come of a race that has fought its way to liberty through the centuries, and we are willing to renew the fight if we must, and, if need be, to sacrifice our all for the new freedom.

While we shall want to give full credit to all who serve in this emergency, I am sure that we cannot deny our special blessing and tribute to those who may be destined to carry the Stars and Stripes across the seas for the honor of America and for the gaining of human liberty. We salute to-night, almost with reverence, all the Aggie men who wear the khaki or the blue. It would be a great relief from our anxiety if the war should cease before these are compelled to go to the very front. But if they do go, we want them to be able to sing, with Alan Seeger: —

When to the last assault our bugles blow:  
Reckless of pain and peril we shall go,  
Heads high and hearts aflame and bayonets bare  
And we shall brave eternity as though  
Eyes looked on us in which we would seem fair —  
One waited in whose presence we would wear,  
Even as a lover who would be well-seen,  
Our manhood faultless and our honor clean.

But we cannot ask our sons to be heroes if we ourselves are cowardly. And so, while we hope and fervently pray that your ranks may not be depleted, that the shadow of death may not intervene, that you will all come back to us whole and sound, — if we are called to mourn, God grant that we may possess the spirit that can say —

Now heaven be thanked, we gave a few brave drops;  
Now heaven be thanked, a few brave drops were ours.

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I hope I am pardoned for introducing this solemn note, but I feel that we should not underrate our task, nor attempt to recoil from its ultimate possible consequences. All of us must steel our souls for the last full measure of devotion.

Yet this is not my last word. I would not have you leave us except in the spirit of trust and hope. It is true that now we must fight this war through to the end, no matter whether it takes five months or five years, and no matter at what cost. But we are college men. There will be much to do when the war is over. The world will never be the same when peace is once declared. New problems will arise that have never come up before in quite the same fashion. The solution of these problems will need the very best leadership that the human race can furnish. The natural supply of leadership is out of the ranks of college men. While we give our present thought to the task of the hour, let us not forget to prepare ourselves also for the morrow of reconstruction that will surely follow the turmoil and suffering of to-day.

Let us not suppose that when this war is over, and, as we confidently believe it will be, won for the political freedom of many nations, our full task will have been achieved. The doors of democracy are swinging wide, and the peoples of the whole earth will soon be marching into the great cathedral of human freedom, there to worship the God of liberty. Such a gigantic forward step cannot be taken in a day, nor without difficulty and struggle. The fight for the full freedom of men, in government, in industry, in thought — a freedom grounded in service and even sacrifice to the common good — is the great call of the new day.

To men graduating from an agricultural college the challenge of the new epoch comes with peculiar force. You can see for yourselves that this emergency has brought agriculture to the front in the minds of all our people. It gives a chance for leadership now and in years to come that may well be the envy of college men everywhere. You step out to-night into a world of opportunity. Agricultural college men never had a better chance to show the stuff they are made of, — to justify their training.

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And so, members of 1917, as you go away from us under these remarkable and unusual circumstances, we all, trustees, faculty, alumni, undergraduates, give you Godspeed. Wherever you may be during these coming months, whether in military camps on this side or in the trenches on the other side, or whether your service consists in helping on the farms or in food supply organization and supervision, I believe you will be where you ought to be, doing your full duty, bringing no reproach upon the College that has nurtured you, nor upon the country that has called you to her colors. Our hearts will be with you; we shall look forward with longing to the day when there may be a glad reunion on the College campus, and when the men of 1917 may gather here with the other "sons of Aggie" in splendid commemoration of all her history, as well as in rejoicing at her part in the present struggle.

REMARKS OF MR. CHARLES A. GLEASON, VICE-PRESIDENT  
OF THE BOARD OF TRUSTEES, AT THE MEMORIAL SERVICE,  
JUNE 11, 1919

My Friends, the Students of M. A. C. If Mr. William Wheeler of Concord, our senior member of the Board of Trustees, an alumnus of this College and a member of the first class, had been here to-day you would have had a fitting word on this memorial occasion.

I hesitate to speak here this afternoon, drafted without any previous preparation, but I do say that I am glad to give a word of personal tribute, and to represent the Board of Trustees on this memorial day. I have been drafted before on different occasions, having a service on the Board of Trustees for over thirty years, but I think I have never met in so solemn a way as we meet here to-day.

Two years ago and a little more, when war was declared, this College had a full number of students who were in earnest about a thorough preparation for the civil duties of life. They were a set of young men that were an honor to any college; they were men that I liked to stand before; to see their faces; and to hear them at Commencement. In a very short time all was changed. The civil was subordinated to the patriotic and military, and in a very few weeks or few months we had small numbers here,

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but the numbers were in the military camps. Now we are changing back, and many of you have been on the other side, many of you have been in our military camps.

We meet here in part to honor you, but we are here more especially to honor those who are not present. I see there are fifty names on this list of men who had the promise of success in life, — who were energetic, ambitious, and who were starting in a career that we all felt proud of; but they laid down their lives — they sacrificed their home interests, their college interests, and their family interests, and they went to the other shores to maintain the honor not only of this nation, but of all the nations of the earth. And we meet here as relatives, as comrades of this College, to do them honor. We mourn them on account of their promise as future citizens. We mourn them as comrades and fellow students of this College. We mourn them, some of us, from dear family ties, and we mourn them as the promise of future citizens of this great nation. And it is a privilege for us to come here, not only to honor them, but I might say, almost, to glorify these names who have done so much for us who remain at home. It is said that not length of days make the successful life, but it is what we accomplish in the days that are given us, and these young men, even though their ages were not great, have performed a service for this College and the future of this country that we can only partly estimate to-day.

I feel that it is a privilege, in representing the Board of Trustees, to speak my very loudest and strongest approval, on this occasion, of their lives, and bespeak for them that honor which I am sure every member of the trustees would voice if they were here to-day.

WORDS SPOKEN IN BEHALF OF THE ALUMNI BY J. B. LINDSEY, '83, AT THE MEMORIAL SERVICE, JUNE 11, 1919

We are gathered here on this beautiful day in June, "sweet amid the bursting fragrance of its roses," to make formal recognition of the services rendered by the alumni and students in the great World War, and to pay especial tribute to the fifty heroes who gave up their lives for the cause of the country they loved.



This College is a comparatively young institution. It did not open its doors for students until two years after the close of the great Civil War, and yet on its original faculty there were two men (two of the "big four," as the late Mr. Bowker used to delight to call them) who in that great struggle rendered gallant service to their country. I refer to the late Colonel W. S. Clark and President Henry H. Goodell.

Colonel Clark, although not an Aggie man, was the first active president of the College. He laid its foundations broad and deep. As major, lieutenant-colonel and colonel he took part in numerous battles, including Chantilly, Roanoake Island, the second battle of Bull Run, Antietam and Fredericksburg. At Chantilly, "he and a few men became separated from their regiment, were surrounded and ordered to surrender. Preferring to run every risk rather than encounter the horrors of Andersonville and Libby, a desperate effort was made to escape, and all were shot down except the gallant colonel. Bullets whistled through his cap and clothing, but unhurt he reached the cover of the woods, and lay concealed within the enemy's lines for three days, suffering from hunger and exposure, until finally he reached the Union forces in safety and was welcomed as one returned from the dead." If those bullets had not gone a trifle wide of the mark, M. A. C. might have had somewhat of a different history.

Henry Hill Goodell, — the beloved, — a teacher at Aggie from 1867 until his death in 1905, and for the last nineteen years president of the College, also rendered conspicuous service in the Civil War, distinguishing himself particularly in the numerous bloody attacks on Port Hudson, and was one of the thousand volunteers — "the forlorn hope" — who responded to the call of General Banks to make the final attack on that rebel stronghold.

And in passing I cannot refrain from mentioning the former Aggie student and West Pointer — the dashing cavalry officer — who afterwards became military commandant at the College, Captain Dickinson, who was born within a stone's throw from the place we now occupy, and in the Cuban War gave up his life in the slaughter at El Caney.

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Speaking to the students in the chapel building yonder, at a memorial service held in 1898 for Governor Greenhalge, he said: "That higher duty, young men, is the one you owe to your country. By your country I do not mean this small space crossed and recrossed by the granite-capped hills which so closely encircle us, but I speak of a country, a part of whose wide domain is always in the sunlight, . . . a country with seventy millions of people, a country of free speech and free religion, a country covered with schools and churches, a country to be proud of, a country to respect, and above all, if need be, a country to die for. This is the spirit which should be taught in our public schools, . . . that the aim of every boy and young man might be to make this, our common country, united. *Then the day will surely come when one could wish no other epitaph than this: 'He lived and died an American citizen.'*" In these last words Captain Dickinson wrote his own epitaph, and you will find it inscribed on the tablet to the left, as you enter the door of the building in which he spoke those very words; and he wrote also a most fitting epitaph for the men who have more recently given all for their country and for humanity. We as alumni, especially the older alumni, love to dwell upon the deeds accomplished by our former teachers and college mates, and we come here to-day with those memories in our minds, to pay homage to the great body of Aggie men who have served their country, both at home and across the sea, and especially to pour out our gratitude, in feeble words, in praise of those brave souls who gave their all that liberty, justice and truth should not perish from the earth.

Faculty and students remember well those eventful April days some two years ago when the President appeared before the National Congress and made his patriotic and solemn address, declaring the United States to be at war with the Central European powers. The College soon closed, and nobly, indeed, did the student body and alumni respond to the call. It was fully realized that of those who went forth not all would return. Faces that shone with patriotism and determination now lie beneath the sod in a foreign country, or in the churchyard of the old home town. Although we are deeply touched and our hearts go out in the most profound sympathy to parents and

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relatives, we cherish a solemn joy that these men, our brothers, were willing and able to give their lives for the country that gave them birth.

Mr. President, the alumni and students, in recognition of the sacrifice made by their brothers for the sake of humanity, have undertaken to provide a fitting memorial, and it is hoped that ere long they will present to their Alma Mater a building dedicated to the heroes who have passed out. It is indeed a large undertaking for so young a College, but so great a cause is worthy of the best efforts of her children. The sons and daughters of the old College should gird on their armor as never before. Many of us could not meet the call for active service, but every one of us can give of his substance to commemorate the life blood of the fallen ones, and to keep aglow the spark of liberty in those who are to come after us. The building should represent not only the best in architecture, but in arrangement and finish within. Beautiful pictures, the gift of classes yet to come, should adorn its walls; paintings of distinguished teachers and alumni should hang in its spacious assembly room; while athletic trophies, as well as curios sent by its sons and daughters who have wandered afar, should find a place beneath its roof. When an alumnus, be he old or young, comes back to his Alma Mater he should find within this building a welcome, and, if possible, a temporary home.

The citizens of this State, and their representatives gathered from time to time at its capital, will appreciate the gift, not only as a slight return for all that has been done by the State to make this College strong, but as a fitting testimonial to fifty of her sons who gave up their lives that free institutions may continue upon the earth.

And as we are thus gathered to pay our modest tribute to those brave souls who have gone up to God, we can all, I am sure, unite in the thought, that —

Martyrs for freedom cannot die.  
When marches end, when strifes are o'er,  
In deathless deeds they live, whose sleep  
The roll-call shall disturb no more.

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### EXCERPTS FROM THE ADDRESS OF DEAN EDWARD M. LEWIS AT THE MEMORIAL SERVICE, JUNE 11, 1919

This memorial service is held in order that we may pay humble and sincere tribute to our brothers who made the great sacrifice, while the tender memories are fresh, and those of us who played and worked with them during their happy college years are still here. Were it possible to postpone it, we should have done so. I am sure that every one of us feels this afternoon that our great leader, who is now in France, would like to be here to say the word we know is in his heart; but there will be another memorial service, more formal, but not more sincere, let us hope, than this. At that time and place he will speak the word that needs to be spoken. . . .

We have with us this afternoon some of the parents, relatives and friends of the boys who have left us. Their sorrow is their sorrow — theirs alone. One of them said to me in a letter I received only yesterday: "I cannot yet believe that my poor big A—— will not return." Neither can we. As we walk about this campus, so precious to each of them, dear friends, we almost expect to meet them at every turn. But we shall never meet them in the flesh again. . . .

As I have said before, we can never read this glorious list of names without realizing the fact that the majority of them were simply boys — "just boys." There are three names on this list that I can never see without wondering how such lads could make soldiers, and yet the list on the tablet before you reveals that the majority of the fifty were in the classes of the last five years, many of them in their teens, — just simply irresponsible, careless, happy boys, running about the campus two years ago, and now dead — in the honor roll of their country; brave soldiers who went over the top without quailing, and gladly gave their all. The best and the only thing that can be said at this time, it seems to me, is this one sentence: "These boys died nobly in a great cause." . . .

The question that we cannot help asking at this hour is, "For what did these boys give up their lives? For what purpose was this great sacrifice?" There are strange voices in America

at the present time, and they sound very strident and pathetic to some of us who remember this country ten or twelve months ago. The partisan and fatalist is speaking loud and boisterously in the newspapers, telling us complacently that "war has always been and war will always be." The cynic sits back in his easy chair, smoking a comfortable cigar, jeering at the thought that a sacrifice for an ideal could be possible. One of them is shouting loud enough to be heard, not only in this country but all over the world, that "we did not go into this war to make Democracy safe for the world." A New England senator declared yesterday that President Wilson's noble "ideals were not our ideals!" Shame on these men. You and I know better than that. These boys went into this war for nothing if not to make this world a better world than it had been before — to destroy the paganism and barbarism of the Hun and to place in their midst instead the holy standards of the gentle Nazarene. . . .

No. There was no question in the minds of these boys. I know it — we all know it who have sat here during the past four years as the President of this College and many other leaders have expounded to them the great principles and ideals the Allies were fighting for. I have seen the early gleam in the eyes of the men in front of the desk change in turn to fiery indignation, to holy passion, to immovable determination, to consecration, complete and unanimous, so that the day when the President of the United States called, they were ready and eager, like thoroughbreds champing at their bits. They left — leaped out of the old campus joyfully, put on their khaki, shouldered their guns, stepped into the ranks, and went into the fight, inspired by a fine frenzy of patriotism, knowing that they fought for the very best and the very finest cause. . . .

Now let me ask you a question. What about a suitable memorial for these dead? How shall we repay the glorious youth of these boys? We can hold, for instance, another and greater memorial service next year when President Butterfield returns. That would be good, but not enough. To hold a memorial service of that kind every year and every month for a thousand years would not be enough to repay them for their sacrifice. We can build them a memorial building as big and fine as Dr. Lindsey described to us a moment ago. That building *will*

be built on this campus (there is nothing surer than that) as a splendid testimony of our appreciation of their great sacrifice, but that will not be enough. The kind of payment that is worth while — the only way we can fully repay them — is by doing something or giving something that will live longer, a good deal longer than any building we build on this or any other campus. . . .

On the top of a lofty height, near my old home in Wales, at the foot of which the present leader of Great Britain has been living all his life, is a great granite tower. As I stood gazing at it seven years ago, I was told that it was a great monument built three hundred and fifty years before to commemorate a great battle for liberty on the part of the Welsh mountaineers against the Anglo-Saxons. It stands there on this lonely mountain peak like a great broken pillar. To-day it *is* a broken pillar, and the ground all about is strewn with great, crude, weather-beaten granite blocks. What remains will crumble in due time, and some day will vanish altogether. It never has been rebuilt; it will never be rebuilt, they say, but still, thank God, — I speak as a Welshman, — the spirit it commemorates resides in the hearts of the Welsh people and grows apace. David Lloyd George and his fellow Welshmen are “carrying on” the spirit of the generation of heroes whom that old tower was built to commemorate; and if he and they did not transmit it, if they did not possess it, that granite tower of three hundred and fifty years ago would be to-day a desecration, not a commemoration. The average Welshman would hang his head in shame in the presence of it, and it would reprove him at every step. . . .

We can build a great monument or a beautiful building here; we can hold solemn memorial exercises like this every year, but it will not be enough. One hundred years, two hundred years, from now it might well be necessary for our children to hang their heads in shame. There is only one thing that we can do, only one thing we must do, at this time. We can and must dedicate ourselves to the cause for which these noble boys died. God witnessing it, let us pledge, in His presence, that from now on we will devote our energies day by day to the great accomplishment for which they died with unsullied honor, with

## M. A. C. IN THE WAR

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pure and undefiled patriotism, and with highest Christian chivalry. . . .

We often say they are gone. Ah, my friends, they have not gone. If there is one thing of which we can be more sure than any other, it is this: we will meet these boys again. We *will* meet these boys again. They will greet us and we will greet them. There is nothing surer in the world. Nothing. . . .

"Behold! I show you a mystery," said the great apostle. "Death is swallowed up in victory." The mystery and miracle is revealed to us anew at this hour. These boys who scorned death have won the "great victory." Henceforth they are immortal, indeed. This is not the hour of sorrow, or of defeat, or despair. It is the glorious hour of triumph and victory, and the trump calls upon each of us to travel the same road, and to travel it hopefully and unfalteringly, till we meet them at the great reunion, when God shall wipe away all tears from our eyes, and there shall be no more separation.





THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF EDUCATION

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**The Massachusetts Agricultural  
College**

**SHORT COURSES**

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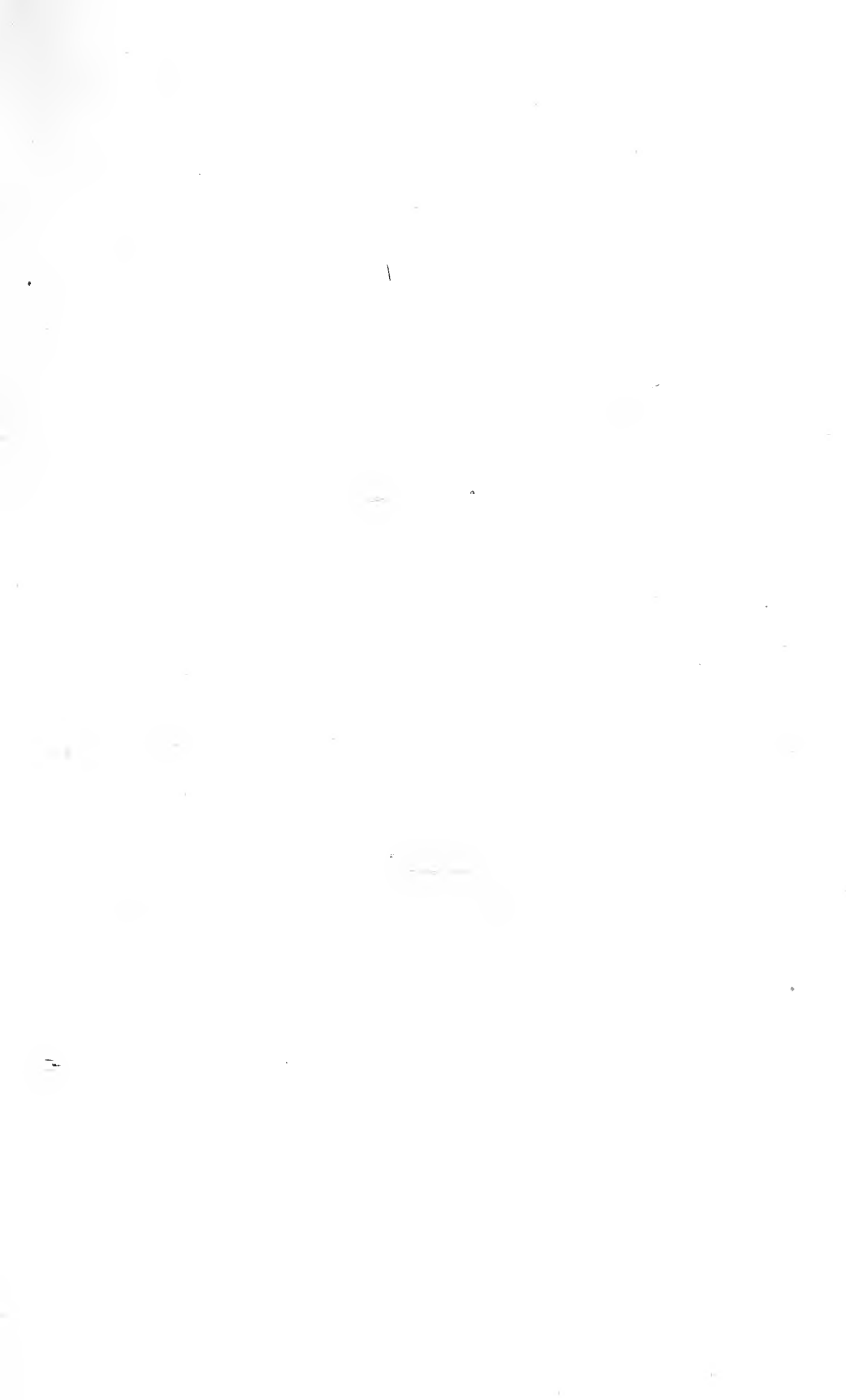
**SUMMER SCHOOLS**

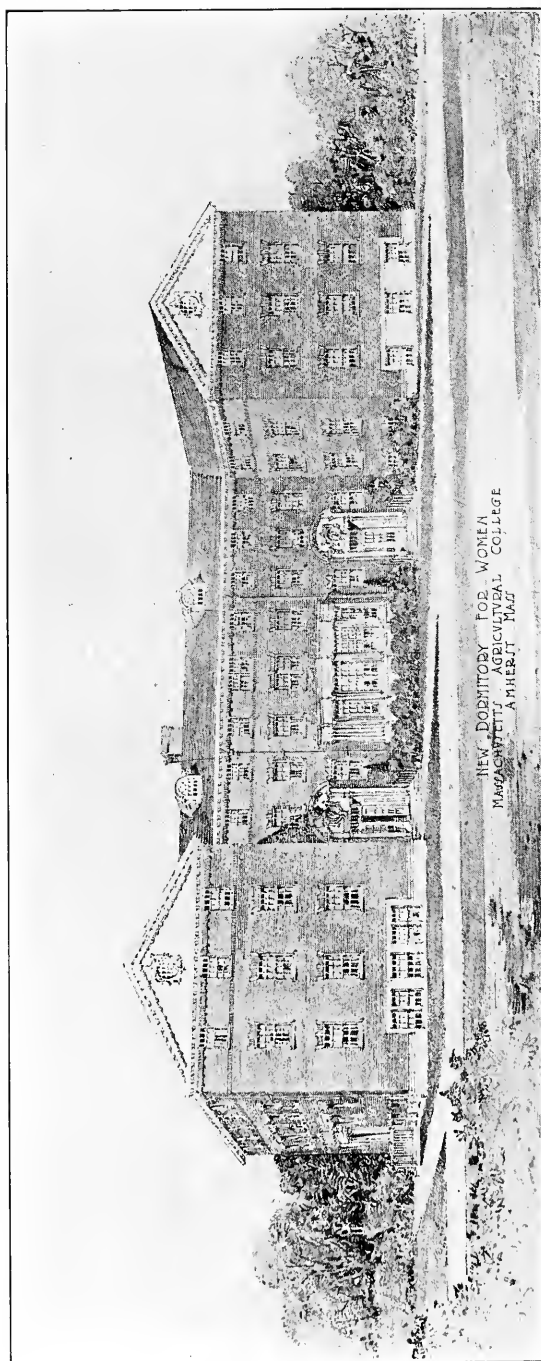
**1921**



**AMHERST, MASS.**







### The Abigail Adams House

The Abigail Adams House, the new dormitory for women students, will be placed at the disposal of women students of the Summer School. This is a new building, conveniently located for all College activities and a natural center for social life on the campus. It will afford a very pleasant and attractive home for ninety-eight Summer School students. There are thirty double and thirty-eight single rooms.

# The Commonwealth of Massachusetts

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DEPARTMENT OF EDUCATION

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THE M. A. C. BULLETIN

Amherst, Mass.

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Volume XII

JUNE, 1921

Number 6

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## SUMMER SCHOOLS

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The Massachusetts Agricultural College

The Division of Elementary and Secondary  
Education and Normal Schools

The Division of Vocational Education of  
the State Department of Education

Co-operating

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SUPERVISOR OF ADMINISTRATION.

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T. GEORGE YAXIS, M.S.Agr. . . . .	Dairying
<i>Assistant Professor of Dairying</i>	

## ANNOUNCEMENT

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The Summer School at the Massachusetts Agricultural College was organized in 1907. It was designed originally for teachers, but its scope has been steadily increased to meet the demands for other types of work. The following schools and courses will be offered in 1921:—

**THE SCHOOL OF RURAL SOCIAL SERVICE.** — This school includes (a) general courses for students interested in the economic and social problems of country life; (b) the conference on social work held by the Simmons College School of Social Work, the New England Division of the American Red Cross and the College co-operating; (c) the school of rural home life.

**THE GENERAL SUMMER SCHOOL.** — Each year there has been a considerable number of students who wish instruction in agriculture, horticulture, home economics, and related subjects. For these classes of students intensive practical courses in these subjects have been provided. Classes in all subjects in the general summer session meet five times per week, so that consistent thorough work may be done, taking into consideration the limited amount of time spent. All courses offered represent the experience of several years in organizing them, so that they may best meet the needs of the students who can conveniently come to the college only at this time. In addition to the work usually offered, Mrs. Reed will conduct courses in clothing efficiency, and a special training course in methods for a limited group of selected students.

**COURSES FOR PUBLIC SCHOOL TEACHERS.** — In order that the needs of public school teachers might be more fully met, a

plan of co-operation was effected in 1919 between the Division of Elementary and Secondary Education and Normal Schools of the State Department of Education and the College. By this arrangement the Division of Elementary and Secondary Education and Normal Schools offers a series of special courses in education for public school teachers. Since these courses have been offered, a large number of teachers have attended every summer. All courses offered in the Summer School are open to the teachers, and many avail themselves of the privilege, since the combination of courses in education, agriculture, horticulture, home economics, and social work makes a particularly attractive program.

**COURSES FOR TEACHERS OF AGRICULTURE.** — The Division of Vocational Education of the State Department of Education and the College co-operate in offering a series of special courses for teachers of agriculture. A full description of these courses and their purpose is found on pages 41 to 46.

**THE TWO-YEAR COURSE.** — A special term of the Two-Year Course in Practical Agriculture will be offered during the summer to accommodate students sent to the College by the Federal Board for Vocational Education. These courses will cover the work of the second term of the first year of the Two-Year Course. This course will continue from June 27 to August 27.

**UNIT COURSES.** — Provision is made in the summer session for students who are sent to the College by the Federal Board for Vocational Education who, on account of lack of preparation, are unable to enter the Two-Year Course in Practical Agriculture.

The date of beginning, also the length of time the schools will be in session, will be found under the head of each school.

## GENERAL INFORMATION

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**Entrance Conditions and Registration.** — There are no entrance examinations for the Summer School. The courses are open to all students seventeen years of age and over who can do and profit by the work selected.

Registration will take place in the Social Union Room, from 9 A.M. until 5 P.M., Monday, June 27. No one will be allowed to register for full-time work after Friday, July 1, except in the special schools. Class and laboratory work begins Tuesday morning, June 28.

**Election of Courses.** — Each student may elect courses of not more than twenty nor less than ten exercises a week, unless special privilege is given by the Director. Election of courses should be made at the time of registration. Every election is subject to the approval of the Director and to the instructor whose course is elected. All courses elected must be carried by the student in a manner satisfactory to the instructor. Regular attendance will be required in each course elected. Examination, test, or notebook will be required in each course. Those who complete at least three courses in a satisfactory manner, and who have practically perfect attendance, will be granted a certificate at the close of the term.

**Board and Room.** — Rooms will be provided for students in the College dormitory and in private homes near the College grounds. The new women's dormitory will be available for women students. There are thirty double and thirty-eight single rooms. A uniform rate of \$3 per week will be charged each student. Each one will be expected to supply her own blankets, sheets, pillow cases, etc. Convenient arrangements for laundry work may be made in Amherst.

All requests for dormitory rooms must be made to the Treasurer of the College. A deposit of \$2 is required in order to secure a reservation in the dormitory. Students will be notified by the Treasurer, upon receipt of the fees, as to the location of the room. In case any change is desired, the request should be made immediately. Deposits will not be refunded after the beginning of the summer session. The deposit is applied to the payment for the room. Rooms outside the College vary considerably in their accommodations and somewhat in price, the charge ranging from \$2.50 to \$4 a week for each person. A list of rooms available in the village will be furnished to Summer School students at the time of registration. Every effort will be made by those in charge to see that every one has comfortable accommodations. A few furnished houses at reasonable rentals are usually available in Amherst during July and August.

The College will maintain a cafeteria on the self-service plan in Draper Hall, on the College grounds. Board may be had at from \$6 to \$8 per week. Good boarding places can also be secured outside of the College if desired.

**Athletics and Recreation.** — Athletics and sports of various kinds occupy a prominent place in the Summer School. Demonstrations of organized play, recreation, folk dancing, and so forth will be given. Late afternoon and early evening periods will be used for this purpose.

The region around Amherst is especially rich in attractive places for tramping, excursions, and picnics. The management of the Summer School usually arranges a suitable amount of this form of recreation.

**Tuition, Fees, and Expenses.** — Tuition is free for the summer session. There are no laboratory or incidental fees in connection with any course.

**Instruction.** — Instruction is given by the regular faculty of the College by means of lectures, recitations, laboratory exercises, and practical field work. The courses for teachers in general education will be given by instructors provided by the Division of Elementary and Secondary Education and Normal Schools. The College and the Division of Vocational Education will co-operate in providing instruction for the courses in agricultural education.

**Rules and Regulations.** — As a guide to those who come to the College for the first time, the following extracts are taken from the regular rules of the College: —

The customary high standard of college men and women in honor, manliness, self-respect, and consideration for the rights of others constitutes the standard of student deportment.

It should be understood that the College, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend but also to name conditions under which students may remain in the institution.

It is the custom of the College that all parties, gatherings, and other social events should first have the approval of some recognized College authority.

**The College.** — The College campus occupies an attractive site three-quarters of a mile north of Amherst center. It is connected with the town and the railway station by electric car service. The College has over 700 acres of land, most of which is in a high state of cultivation, and illustrates most of the leading agricultural industries of Massachusetts. There is a large range of greenhouses of the most modern and approved type; there is a modern dairy barn with dairy cattle; there are good horses, pure-bred swine, sheep, and poultry; there are fields of corn, potatoes, clover, and grass in season; orchards of apple, peach, plum, and pear trees; tracts of good forest land, nurseries, and market gardens. There are also considerable tracts devoted to experiments, many of which are of unusual interest. Then there are well-equipped departments of botany,

entomology, and chemistry, dealing in the most thorough manner with these special sciences. The advantages of the plant equipment and teaching staff are made available to Summer School students.

**The Library.** — The College library occupies the entire lower floor and basement of the Chapel-Library building. It contains more than 65,000 volumes in addition to a large number of unbound periodicals and pamphlets. Works on agriculture, horticulture, botany, entomology, and the various sciences predominate, but literature, history, economics, and sociology are well represented and receive due attention. In addition to a few newspapers and the best farm papers, the reading room is supplied with a good variety of popular periodical literature, encyclopedias, and general reference books. The equipment is such that the library ranks extremely well with the agricultural libraries of the country.

Summer School students should be able to find excellent material for their line of College work, and are cordially invited to make use of the library and its equipment. The librarian and library assistants are always on hand, ready and willing to be of assistance.

The library hours are from 8 A.M. to 12 M., and 1 P.M. to 5 P.M. every week day.



## SUMMER SCHOOLS

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### THE SCHOOL OF RURAL SOCIAL SERVICE

June 27 to July 23

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Special emphasis will be laid upon a group of courses for those who might be classed as rural social workers. The demand for trained men and women who have an appreciation of the general problems of country life and who are prepared to give some specific form of service is steadily increasing. The courses in the School of Rural Social Service are intended for teachers of agricultural economics, rural sociology, and agricultural education, research workers in these fields, agents of the Red Cross, leaders in Y. M. C. A. and Y. W. C. A. work, country clergymen, and others who devote a part or all of their time to problems of community development.

A special feature of the School of Rural Social Service will be the two weeks' conference held for social workers by the Simmons College School of Social Work, the New England Division of the American Red Cross and the Massachusetts Agricultural College co-operating.

This conference is intended to serve three groups: (1) persons seeking information about social work in relation to teaching and other community activities; (2) social workers in small towns and rural communities; (3) urban social workers. This conference will be held July 5 to 16.

Representatives of the School of Social Work and of the New England Division of the Red Cross will be present to conduct conferences on the technical phases of social work. See page 19 for a list of courses offered in the conference.

Another special feature of the School of Rural Social Service will be the School of Rural Home Life. The courses in this School are for the mother of the family, the daughter and others whose special interest lies in the development of the home. This school will be held from July 18 to 25. A full description of the courses offered will be found on pages 21 to 23.

The following courses are offered in the School of Rural Social Service: —

1. Rural Organization
2. Problems of Government
3. The Elements of Rural Sociology
4. Seminar in Rural Sociology
5. Marketing Agricultural Products
6. Seminar in Agricultural Economics
7. Eugenics
8. The Rural Survey
9. Social Morality and Character Standards
10. The Country Girl and the Country Woman
11. Village Life
12. Rural Leadership
13. Organized Play and Recreation
14. Dramatic Presentation
15. Design and Practical Arts
16. Extension Organization and Administration

**Rural Organization.** — A study of the organized agencies by which rural communities carry on their various forms of associated life. The nature of the course will be seen from the following topics: the community idea, community farming, the betterment of country life, the rural social forces and agencies, the principles of rural community building, and the development of a rural policy, State and National. Five exercises per week; four weeks.

*President Butterfield*

**Problems of Government.** — This course is intended for women students who wish a working knowledge of the relation of government to the social and economic problems of the day. It will be of

particular value to social workers, since it will be such a course as might be given to women voters in small towns. Five exercises per week; four weeks.

*Dr. Sprague*

**The Elements of Rural Sociology.** — A survey of the field of rural sociology, including such topics as the development of rural life in New England and the West. A consideration of the religious, educational, and social ideals, characteristics and influence of the rural environment, rural institutions, the school, the church, and local government, rural organization, and a brief consideration of the movement in the organization of rural affairs. Five exercises a week; four weeks.

*Dr. Sims*

**Seminar in Rural Sociology.** — A seminar course designed for teachers, or prospective teachers, of rural sociology will be offered.

Registration for this course will be limited to men who in the judgment of the instructor could later be recommended for a position. Five exercises per week; four weeks.

*Dr. Sims*

**Marketing Agricultural Products.** — This course deals with the principles, methods, and social cost of our present system of marketing farm products. The importance of marketing, fundamental principles, present methods of sale, movement of products from producer to consumer, the wholesale trade, the necessity of middlemen, the transportation factor, economic wastes, costs of marketing, prices of farm products, speculation, improvements in distribution, what the farmer can do, government assistance, organized marketing, collective bargaining, protective and remedial measures, are some of the topics covered. Seventeen lectures. Texts, Weld and Adams. Each member of the class will be required to study the market for some farm product and present a written report thereon. Five exercises per week; four weeks.

*Dr. Cance*

**Seminar in Agricultural Economics.** — A course for advanced students in agricultural economics will be arranged if requested by six or more students whose previous preparation is such as to enable them to take an advanced course.

*Dr. Cance*

**Eugenics.** — This course deals with the origin, history, needs, and methods of race improvement. It presents the facts concerning the extent of incapable and defective human stock, its relative fecundity, and economic and social cost. The course will consist of lectures, discussions, assigned readings, and papers. Five exercises per week; four weeks.

*Dr. Sprague*

**The Rural Survey.** — A course of lectures on purposes, methods, and practical value of surveys of various phases of rural life. The following subjects will be treated by persons who have outlined and conducted the surveys for specific purposes: —

1. The Survey Idea
2. Farm Management Surveys
3. Social Surveys
4. Educational Surveys
5. Moral and Religious Surveys

Five exercises per week; four weeks.

*Dr. Sims*

**Social Morality and Character Standards.** — Social morality: a course in the psychology of adolescence, with emphasis on recreation as a solution of the sex problem. Social relationships between boys and girls, and moral standards in the community.

Health: two lectures on the bearing of physical conditions on character. Woman's new attitude to health and the new standards of health as factors in social morality.

Story-telling: Bible story-telling as a means of helping girls to formulate standards of conduct seven days in the week. Five exercises per week; four weeks.

**The Country Girl and the Country Woman.** — The education of the country girl, an analysis of the problem, certain present-day attempts to meet it, the wider scope of home-making courses.

The farm woman, her relation to the family, farm and State, social opportunities, education which makes more capable house-keepers and gives training for broader living, economic function of woman in the household and on the farm. Five exercises per week; four weeks.

**Village Life.** — This course covers the history and development of village life in general and especially with reference to America. Village growth, distribution, organization, and government will be noticed. The various problems, such as those arising from leadership, economic, recreational, religious, moral and sanitary conditions, will be studied. Programs and agencies of reform and improvement will be canvassed and criticized. The course is designed to acquaint the student with the status and limitations and possibilities of the little town. Five exercises a week; four weeks.

*Dr. Sims*

**Rural Leadership.** — This course will consist of (1) a survey of the field of leadership, with view to indicating opportunities of rural service; (2) ways and means of development of leadership through education and training; (3) analysis of the psychological and sociological elements of leadership. Five exercises per week; four weeks.

*Professor Campbell and Mr. Puffer*

**Organized Play and Recreation.** — The theory and demonstration of play as a creative force, developing in the individual social consciousness, and in the group individual responsibility for standards of living in the home and the community. There will be special emphasis on methods of organizing and directing games. An effort will be made to work out games that will contribute to the social life

of the community. Demonstrations form a prominent feature of the work. Three lectures and two afternoon demonstrations a week; four weeks. Two sections.

**Dramatic Presentation.** — The great field for the drama in the rural communities as an aid to scientific methods in agriculture, high standards in rural life, and for self-development and delight, makes some knowledge of the interpretation of plays, of the stage and its parts, of its effective use and of the art of acting, very desirable. The members of this class will be rehearsed in several plays. Each member will appear in one or more plays. One or two of the best plays will be given a final presentation before the school. Five hours a week; four weeks.

*Professor Patterson*

**Design and Practical Arts.** — Lectures and laboratory work developing the value of design, color, and handwork as a rural school asset. Work in binding and its various problems, basketry, elementary weaving, thin and thick cardboard construction, leather work, and rural dyeing; also other phases of rural prevocational subject matter; also rural community craft-work. Those taking this work should bring 9 by 12 inch drawing paper, carbon paper, scissors, ruler, eraser, knife, and pencils. Five exercises a week; four weeks. Two sections.

*Mr. Ried*

## CONFERENCE ON SOCIAL WORK

July 5 to July 16.

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A series of special courses designed particularly for Red Cross workers and others who wish instruction and information in regard to rural affairs will be given this summer at Amherst by the College, the American Red Cross and the Simmons College School of Social Work co-operating. The special courses listed below have been provided to meet the particular needs of this group. However, all courses offered by the College are available to the students enrolled in the conference. From all these courses a group of studies can be arranged which present the rural problem from several standpoints and will serve to show the relationship to the workers, and the different lines to their respective fields and to the larger community problems which are constantly being presented to them. The conference will be similar in purpose to that held last year in connection with the Maine Rural Teachers' Plattsburg at Castine.

1. **Seminar in Social Work.** — A consideration of the present problems that confront the social worker in rural communities. This seminar will be conducted in an informal way. Contributions will be made by the students, social workers, and others who have a first-hand knowledge of rural conditions.

*Dr. Queen*  
*Simmons College School of Social Work*

2. **The Rural Community.** — A series of lectures dealing with the various phases of the rural problem, the origin and development of the rural community, the organization of the community, leadership, etc.

*President Butterfield*  
*Massachusetts Agricultural College*

3. **Rural Recreation.** — This course will include a discussion of the psychology of recreation as related to rural life. There will be a demonstration period in which games suited for the rural groups will be taught.

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4. **Seminar for Red Cross Workers.** — Red Cross peace-time work in the smaller cities and rural districts. Discussion of the problems of organization and administration arising in Red Cross Chapters and Branches.

*Miss Hardwick*

*New England Division American Red Cross*

5. **Rural Organization.** — This course will be adapted to people who contemplate organized work in lines other than that of the home demonstration agent or home economics extension specialist, such as district nurses; Red Cross county workers; Y. M. C. A. secretaries, State and county; co-operative farmers' associations; fruit growers organizations; egg circles; breeders' associations. There will be assigned readings and problems which will be based on the past experience and future plans of members of the class. Course will include a discussion of organizations working in the rural field. A practical course designed to fit the needs of a field worker for the organization and execution of State and county work with rural people. Five hours a week: two weeks.

This course will be repeated during the last two weeks if requested by 6 or more students.

*Assistant Director Redman*  
*Extension Service, M. A. C.*

6. **Problems of Child Welfare.** — Mr. E. A. Puffer of the National Child Welfare Association will give, during the week of July 5 to 9, a series of lectures on juvenile psychology. Some of the topics will be: The Meaning of Adolescence, The Prevention of Delinquence, The Choice of a Vocation for Boys, The Handling of Difficult Boys, etc.



## SCHOOL OF RURAL HOME LIFE

July 18 to July 25

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A special program devoted to the study of vital problems and interests which make for the best in family life will be offered. There will be topics of interest for the mother of the family, for the daughter, for the community worker, and for the teacher. Ways and means of adding to the family income, recreation for the family, community enjoyment and the natural resources of the country, practical ways of dealing with home problems, — all will be discussed by leaders in these various fields.

An especially helpful part of the program will be the arrangement of conference hours, when those interested may meet together for informal discussion with these leaders and with those from other communities who are facing many of the same problems.

The week chosen for this session immediately precedes Farmers' Week, so that those who care to do so may arrange to spend these two consecutive weeks on the campus.

A special program for Sunday will be arranged which will emphasize the relation of the home to the church and the community.

**The Family at its Best.** — A series of addresses discussing the welfare of the family, the maintenance of family ideals, the relationship of parents and children, the enrichment of home life through hospitality, and the dependence of community welfare upon the individual home. Four lectures.

*Miss Sarah Louise Arnold*

**Recreation.** — One period each day during the School of Rural Home Life will be given over to general recreation. There will be demonstration of games and plays for home and community groups,

community singing, and folk dancing. In connection with this course a series of lectures on Child Welfare will be given. Such topics as the Meaning of Adolescence, The Handling of Difficult Boys, the Choice of a Vocation for Boys and Girls, etc., will be treated.

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**Flowers, Trees, and Shrubs.** — A brief course including: (1) a discussion of the flowers and plants which are desirable for use on home grounds; (2) an inspection trip to observe material in the gardens of the Department of Floriculture; (3) a discussion and demonstration of the use of flowers in the home; (4) the arrangement and planting of trees and shrubs will be taken up for two periods.

*Professor Thayer and Professor Thompson*

**Food Preservation.** — This is a practical course in the preservation of food. The canning of fruits and vegetables, together with the making of the more important fruit and vegetable products, will be studied in the laboratory. Students will be expected to do the work themselves. Only such lectures as are necessary to a clear understanding of the work in hand will be given. Our laboratories are well equipped for work of this kind. Students will have opportunity to make a study of equipment and containers, and will be given every facility possible to study and apply methods of food preservation as applied to the home. One two-hour period daily.

*Professor Chenoweth*

**Clothing.** — This course includes a study of textiles used in clothing, cost and care of clothing, designing and drafting patterns, and the making of clothing. The work consists of demonstrations, discussions, and practical laboratory work.

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**Vegetable Gardening.** — A course of six lectures on the following topics will be given: (1) garden soils; (2) green manure and

cover crops; (3) commercial fertilizers and lime; (4) growing early vegetable plants, hotbeds and cold frames; (5) planting, transplanting, thinning, and watering; (6) harvesting and marketing.

*Professor Dacy*

**Poultry Raising.** — A course of six lectures on the following topics will be given: (1) opportunities and possibilities in poultry culture; (2) economic housing of poultry; (3) feeds and feeding of poultry; (4) hatching and rearing chicks; (5) how to manage a flock of hens; (6) poultry diseases and disease control.

*Professor Graham*

**Home Problems.** — A round table discussion of practical problems in every-day life of the country home, such as greater satisfaction in earning and spending the family dollar; removing the drudgery idea from farm life; home industries that will supplement the income and hold and develop the family interests; the marketing of home products; our young people; the educational and social agencies that broaden and sweeten rural life.

This discussion hour will be conducted by one who knows these problems from first-hand experience. She has met them in her own home, and watched the solution as worked out in many homes and communities in New England, New York, Florida, and parts of the West.

*Mrs. Dimock*

**Home Furnishing.** — This course aims to develop in students good judgment and right standards in the selection and arrangement of home furnishings, that they may express themselves in their environment. A well-arranged, attractive home contributes largely towards a contented happy home life. There will be discussions of color combinations, good spacing, also the treatment of floors, walls, and woodwork, and practical problems in the choice and arrangement of furnishing from a sanitary, economic, and artistic standpoint. Use will be made of illustrative material.

*Mrs. Chamberlain*

# **COURSES IN AGRICULTURE, HORTICULTURE, HOME ECONOMICS AND RELATED SUBJECTS**

**June 27 to July 23**

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The courses in agriculture and horticulture are intended for those classes of students who wish to secure short practical courses in agriculture, horticulture, and related subjects, yet who can come to the College at no other time. The courses consist of lectures, demonstrations, and laboratory work. The instruction is thoroughly practical throughout. The experience of a number of years has shown the type of course that best meets the needs of the Summer School students.

The courses in home economics are designed: (1) for teachers of home economics who wish instruction in both practical methods and subject matter; (2) homemakers who wish to add to their fund of practical knowledge. The demand for these special courses is steadily increasing.

The following courses will be offered in agriculture, horticulture, home economics, and related subjects: —

1. Soil Fertility
2. Manures and Fertilizers
3. Types and Breeds
4. Feeding and Management
5. Dairying
6. Farm Management
7. Farm Accounts
8. Poultry Husbandry
9. Farm Machinery and Gas Engines
10. Fruit Growing

11. Flower Growing
12. Vegetable Gardening
13. Food Preservation
14. Foods and Nutrition
15. Foods I.
16. Elementary Dietetics
17. Clothing
18. Business of the Household
19. Insect Life
20. Native Ferns
21. Plant Life
22. Plant Diseases
23. Agricultural Opportunities for Women
24. Extension Organization and Administration

### Agriculture

**Soil Fertility.** — A course designed to acquaint the student with the nature of soils, their properties, and management. The origin and formation of soils, their physical and chemical characteristics, moisture control, including drainage and irrigation, tillage, the supply and maintenance of soil organic matter, soil acidity, and liming the soil will be considered. Attention will be drawn to factors contributing to the depreciation of soil fertility and to ways and means of maintaining permanent fertility. Five exercises a week; four lectures and one two-hour laboratory or field exercise; four weeks.

*Professor Beaumont*

**Manures and Fertilizers.** — This course is planned to supplement the general course in soil fertility. Manures, fertilizers, and soil amendments will be studied in detail. Considerable time will be devoted by the student to actual work with fertilizing materials, and he will be expected to become thoroughly familiar with farm manures, forms of agricultural lime, and commercial fertilizers, their composition, properties, care, and use. Students taking this course will be expected to take the general course in soil fertility or to have

had its equivalent. Five exercises a week, consisting of two lectures and three two-hour periods which will be used for laboratory work, field trips, or study periods; four weeks.

*Professor Beaumont*

**Types and Breeds.** — This course is a study of the history of the various breeds of cattle, sheep, swine, and horses; their origin and development; their characteristics; and a discussion of the conditions to which each breed seems best adapted. The laboratory work will give the student an opportunity to do practice judging, which will familiarize him with animals of the different types and breeds. Textbook: Plumb, "Types and Breeds of Farm Animals." Three class hours and two two-hour laboratory periods a week; four weeks.

*Professor Salisbury*

**Feeding and Management.** — A study of the fundamental principles of animal nutrition; of the composition and quality of feeding materials and their relative importance for the different classes of farm animals; of feeding standards and the calculation of rations. The latter part of the course will consist of a study of the feeding, care, and management of dairy cattle, swine, sheep, and horses, giving special attention to economic production. How to feed to get a large flow of milk, how to fatten, and how to grow breeding animals will receive proper attention. Five hours per week; four weeks.

*Professor Salisbury*

**Dairying.** — This course is designed to acquaint the student with the science of dairying and its important place in the agriculture of New England. It is desirable that all people should know more of the value of milk and dairy products, and the vital place which they occupy in the diet of the American people. This course covers the composition and secretion of milk; the Babcock test for fat in dairy products; up-to-date methods of separating cream from milk; the

modern ways of making butter and cheese of quality; the importance of milk as a food, its cheapness, care, and handling, and its relation to the public health. Five lectures per week; four weeks.

*Professor Judkins*

**Dairy Laboratory.** — This course gives the actual practice in testing dairy products, handling milk, separating cream, and making butter and cheese as outlined in the foregoing course. Students taking the dairy laboratory work are required to take the dairy lectures as outlined above. Two three-hour laboratories per week; four weeks.

*Professor Judkins*

**Farm Management.** — A study of some of the problems of modern farming and the factors that influence success, such as the choice of a region and of a farm, types of farming, size of farm, rotation of crops, and labor problems. Three lectures a week; four weeks.

*Professor Foord*

**Farm Accounts.** — Actual practice in the use of a simple system of farm accounting, including cost accounts suitable for the large or the small farm. Two two-hour laboratory periods a week; four weeks.

*Professor Foord*

**Poultry Husbandry.** — This course includes a study of breeds and varieties, according to their standard and utility classification; incubation and brooding; housing; feeds and feeding; marketing eggs and poultry; and management of the flock. The laboratory exercises consist entirely of practical work. This includes a careful study of all the characters involved in selecting hens for high and low egg production; killing and dry picking, drawing, trussing, dis-

jointing, and caponizing; a comparative study of scratch feed mash, dairy, and slaughterhouse by-products. Four lectures and one laboratory period a week; four weeks. Two sections.

*Professor Graham*

**Farm Machinery and Gas Engines.** — This course is intended to familiarize the student with the various types of farm implements, to teach him their operation and care, and to give practice in the adjustment and repair of the mechanical equipment on the farm. The various types of field implements are studied, and emphasis is laid on the selection of implements suited to New England conditions. The gas engine is studied, and the application of the engine to farm work is taken up in detail. The farm tractor and the automobile are given due importance, and considerable time is devoted to the care and repair of these machines. The various types of carburetors and ignition systems are studied, and practice given in the location and repair of engine troubles. Two lectures and three two-hour laboratory periods; four weeks. One section.

*Professor Gunness*

*Mr. Denman*

## Horticulture

**Fruit Growing.** — A study of modern methods of propagating, planting, cultivating, pruning, fertilizing, and spraying fruit trees; planning and managing orchards; selling fruit. Lectures, demonstrations, and field exercises. Five exercises a week; four weeks. Two sections.

*Professor Sears*

**Flower Growing.** A. GARDEN FLOWERS. — This part of the course aims to familiarize the student with the methods of propagation and culture, use and value of the most important plants used in flower gardens, including annuals, biennials, perennials, bedding plants, bulbs, and roses. Soils and fertilizers, as applied



to flower gardening, will be considered. The Department of Floriculture has a large garden devoted to the culture of annuals and perennials which provides material for study.

**B. INDOOR FLOWER GROWING.** — This work is intended for those who wish to grow plants indoors without the use of a greenhouse. It will include a discussion of soils, fertilizers, and containers; methods of propagation and culture of plants suitable for use in the schoolroom or in the home. The filling and care of baskets, window and porch boxes will be considered. Five lectures and one two-hour laboratory period a week; four weeks.

*Professor Thayer*

**Vegetable Gardening.** — This course will consider the principles underlying the successful culture of vegetables in the home, school, community, or factory garden. It will include a study of the preparation of the land, fertilizers and manures, seeds and seeding, the growing of plants in hotbeds and cold frames, planning and planting the garden, garden tools, the harvesting and storing of the garden products. Application of the principles studied in the classroom will be made in practical exercises in the student's gardens and with the large variety of crops grown on the 10 acres of land operated by the Vegetable Gardening Department. Three classroom periods and two two-hour laboratory periods a week; four weeks. Two sections.

*Assistant Professor Dacy*

**Food Preservation I.** — This course aims to place before the student the latest and best methods in canning, evaporating, and the making of fruit and vegetable products, together with a study of the most approved types of equipment.

Fruits and vegetables will be canned in both tin and glass, using the hot-water bath, the water-seal canners, steam-pressure canners, and steam pasteurizer. Special attention will be given to the preservation of fruits and fruit juices for culinary purposes. Both home and commercial types of evaporators will be used for evaporating such fruits and vegetables as are available.

The manufacture of various fruit products, such as jams, jellies, preserves, butters, pastes, and leathers will occupy about one-half the course. The home manufacture of vinegar, sauerkraut, hominy, and other commonly used products will be studied if time permits.

Special attention will be given to the utilization of the surplus and cheap grades of fruits and vegetables so frequently a source of loss to the grower.

The course is planned primarily for the housewife and the teacher, but much of the work may be adapted to the community center or the small home factory. This course is a practical one, in that all theories and principles discussed in lectures will be applied by the student in the laboratory work.

Two lectures and three two-hour laboratory periods per week; four weeks. Class limited to fifteen students.

*Professor Chenoweth*

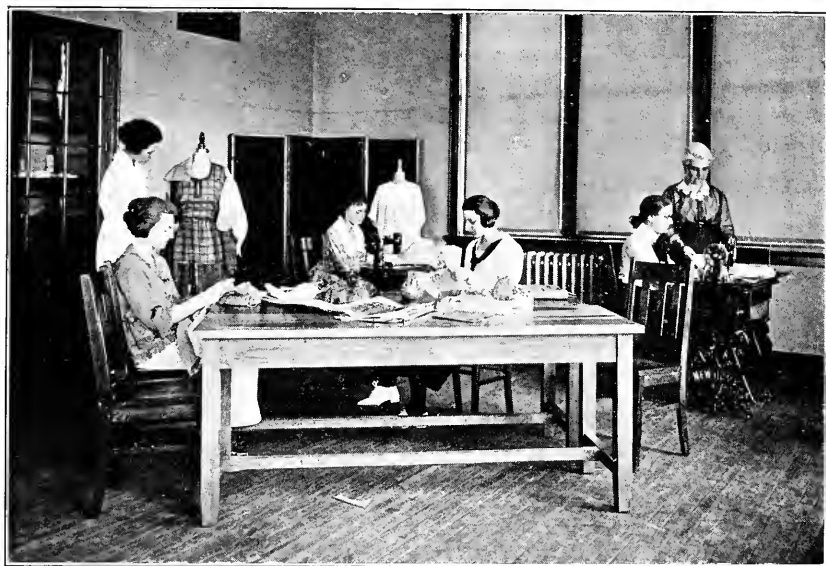
**Food Preservation II.** — This course is offered for those who cannot devote the full four weeks to this type of work. Either the canning and drying or the manufacturing of fruit and vegetable products as outlined above will be studied, as the class may elect. Two lectures and three two-hour laboratory periods; last two weeks. Class limited to fifteen students.

*Professor Chenoweth*

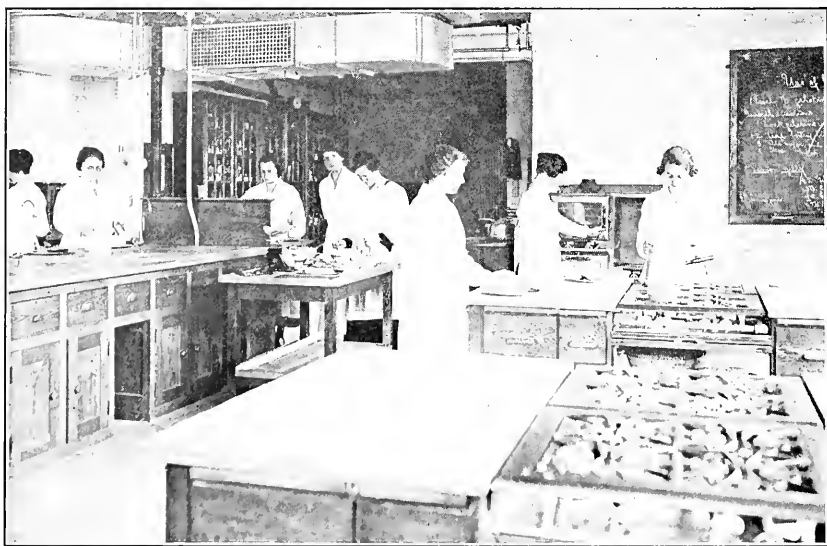
## Home Economics

**Foods and Nutrition.** — This is a course planned primarily for teachers and for those interested in nutrition of school children. Consideration will be given to the fundamental principles in the selection and preparation of food, the organization of nutrition study groups for children, the conduct of the school lunch with limited equipment. Three two-hour laboratory periods and two lectures per week; four weeks.





Clothing Efficiency



Practical Work in Food Preparation

**Foods I.** — A course planned to meet the needs of those concerned with the problem of the selection and preparation of food in the home. Study is made of the fundamental principles underlying the cookery of various types of foods to conserve the largest amount of nutrients. It will include the planning and preparation of breakfasts, luncheons, dinners, and suppers. There will be laboratory work of practical value. This course must be accompanied by elementary dietetics. Three two-hour laboratory periods per week; four weeks.

**Elementary Dietetics.** — The welfare of the family is so largely dependent upon food that this series of lectures is offered. Special study will be made of the needs of the body, the selection of foods to supply those needs, and the relative nutritive value of various foods. Consideration will be given to the planning of balanced dietaries, and to such special problems as infant feeding. This course should be accompanied by Foods I. Two lectures per week; four weeks.

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**Clothing I.** — This course includes a study of the selection and care of clothing, appropriateness, and simplicity in dress, keeping in mind not only the expenditure of money but also the expenditure of time and labor in making and maintaining. The work consists of discussions, demonstrations, and practical laboratory work. Three two-hour laboratory periods and two lectures per week; four weeks.

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**Business of the Household.** — There are many efficient methods successfully used in the business world which can be applied in the business of home making.

Since the home maker is largely responsible for all expenditures connected with the house, an important consideration in this course is the study of the family budget, the apportionment of the income, and the keeping of accounts.

Equally important is the standardization of household tasks, the study of systematic methods of work, selection and care of equipment, and the use of time and labor saving devices. Two lectures per week; four weeks.

*Professor Skinner*

**Extension Organization and Administration.** — This course will present up-to-date facts concerning the organization and execution of extension work in agriculture and home making. The work will take up in some detail the more effective methods in use in the various States and the adaptation of these methods and plans to conditions in New England. Students will be expected to turn in written solutions of problems presented by the instructor or selected by them in conjunction with the instructor. There will be assigned readings in the light of training, experience, and future plans of members of the class. This course open to those taking Clothing Efficiency training course for teachers and to others whom the instructor may admit. Five hours per week; four weeks.

*Assistant Director Redman*

### **Related Subjects**

**Insect Life.** — This is an introductory course arranged with particular reference to the needs of teachers in grade schools and high schools who are expected to teach about insects, either as a part of nature study or in their relation to agriculture. The course is also planned to be a useful one for persons not teachers who desire a general knowledge of insects and methods for their control. Familiarity with the most common insects, particularly the injurious ones, a general knowledge of how they live and how and when they may best be attacked, are the main topics included in the lecture work. Field exercises, examining living insects, their habits, and the injuries they cause will be arranged for in addition to the regularly

scheduled hours for those who may desire them. Five exercises a week; four weeks. Two sections. Not offered during 1921.

*Assistant Professor Regan*

**Native Ferns.** — This is a popular course for the study of our native ferns. Brief study of life history is conducted in the laboratory. Most of the time is spent in the field with identification keys and in becoming familiar with the ferns in their native haunts. Three two-hour periods a week; first two weeks.

*Professor Osmun*

**Plant Life.** — An outline of the anatomy, morphology, and physiology of higher plants. This course is especially suited to the needs of teachers of science and nature study and to amateur botanists. Previous training in the subject is not required. Five exercises a week; first two weeks.

*Professor Osmun*

**Plant Diseases.** — The more common diseases of vegetable, fruit, and flower crops are considered, together with methods of control. The course is planned to meet the needs of teachers and others interested in gardening and garden supervision. Diseased plant materials are used for illustrative purposes. The course in general botany should be taken as a preparation for this course by all who have had no previous training in botany. Five lectures a week; last two weeks.

*Mr. McLaughlin*

**Agricultural Opportunities for Women.** — Agriculture is a field in which women are finding increasingly good opportunities. The particular problems which the women engaged in farming will have to meet, and the special lines of farming in which they will have favorable opportunities, will be considered in a series of conferences. By arrangement.

*Miss Hamlin*

## SPECIAL COURSES FOR PUBLIC SCHOOL TEACHERS

June 27 to July 23

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The Division of Elementary and Secondary Education and Normal Schools of the State Department of Education offers the following special courses for teachers who desire to advance professionally and for men and women who wish to prepare for teaching: —

1. Methods for Elementary Schools, with Special Reference to the Rural School
2. Methods in English for Intermediate and Grammar Grades
3. Primary Language
4. Primary Reading
5. Methods of teaching Arithmetic for Intermediate and Grammar Grades
6. Methods of teaching History in the Grammar Grades
7. Training in the Duties of Citizenship

In addition to these special courses, teachers may elect such courses as they desire from the general College program. The number of courses offered in the Summer School provide for combinations that will meet the needs of all. The attention of teachers is directed to the following courses: French and Spanish, Mathematics, Sanitation and Hygiene, Trees and Shrubs, offered by the College, but listed under Courses for Public School Teachers, and to the courses offered in the School of Rural Social Service.



## COURSES FOR PUBLIC SCHOOL TEACHERS

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**Methods in English for the Intermediate and Grammar Grades.** — A method course in language, literature, and grammar for both experienced and inexperienced teachers of grades 4 to 8.

The course will include a consideration of the following topics: —

The elements of modern practice in English teaching; the selection of standards; "oral English;" the "single-phase idea;" the "single-sentence idea;" the study of a masterpiece; how to select a good reading book; speech defects; letter writing; pictures and illustrative material; the problem-project method; effective English; minimum essentials in grammar; debating; measuring results; the critical examination of modern texts in this field.

Prospective students in this course should, if possible, bring a copy of "Miles Standish," "Evangeline," "The Lady of the Lake," and "Enoch Arden."

The texts used will be "Speaking and Writing English" by Sheridan, published by Benj. Sanborn & Co., and "Method and Methods of Teaching English" by Goldwasser, published by D. C. Heath & Co. Three or four of these texts will be available for reference, but students will find it to their advantage to secure them in advance, or be prepared to purchase them at the College book store.

Lectures, reports, assigned readings, illustrative lessons, and class discussions. Five exercises a week; four weeks.

*Superintendent Merriam*

**Methods in Elementary Schools.** — A general method course for elementary school teachers. The course will include a consideration of the following general topics: the vital elements of modern practice in the elementary school; the selection, evaluation, and

emphasis of subject matter of the common school branches; the socialization of instruction; methods which foster health; the problem-project method; the utilization of common interests; program making; the recitation; standards for judging pupils' work; the critical examination of modern textbooks.

The course is intended for both experienced and inexperienced teachers. It will be organized to meet the specific needs of the group registered for it.

The texts used will be "Modern Elementary School Practice" by Freeland, published by The Macmillan Company, and "How to teach the Fundamental Subjects" by Kendall and Myrick, published by Houghton Mifflin Company. Three or four of these texts will be available for reference, but students will find it to their advantage to secure them in advance, or be prepared to purchase them at the College book store.

Lectures, reports, assigned readings, and class discussions. Five exercises a week; four weeks.

*Superintendent Merriam*

### **Method of teaching History in the Grammar Grades. —**

This will be a course in the methods of instruction in history in the upper grades. It will include discussion of the subject matter, lesson assignment, methods of recitation, maps, examination of texts, and type lessons. Topical history teaching, the socialized recitation, the study recitation, and motivation in history work will be emphasized. Teachers should bring with them one or more modern history textbooks. Kendall and Stryker's "History in the Elementary School," published by Houghton Mifflin Company, will furnish a basis for the work. Five exercises a week; four weeks.

*Mr. Smith*

**Training in the Duties of Citizenship. —** This will be a course in the methods of instruction in training in the duties of citizenship. This course will include a discussion of the educational





Practical Work in Vegetable Growing



Organized Play



value of pupil activities, including pupil participation in school government, junior civic leagues, school gardening, and the enlistment of pupils in public welfare movements. The classroom work will consist largely of illustrative lessons which will be discussed and worked out by the teachers themselves. The text used will be Ziegler and Jaquette's "Our Community," published by The John C. Winston Company. Five exercises a week; four weeks.

*Mr. Smith*

**Primary Language.** — This course will deal with methods of presenting all types of language work given in the first four grades. Special emphasis will be given story-telling and dramatization. There will be discussions of subject matter. Plans will be written and lessons presented. Five exercises a week; four weeks.

*Miss Moffitt*

**Primary Reading.** — This course includes a discussion of the various systems used throughout the State and the principles underlying them; phonics, with application to work in the different grades, also with foreigners and children with speech defects; and various types of silent and oral reading lessons. Five exercises a week; four weeks.

*Miss Moffitt*

**Geography.** — This course will include methods of dealing with different phases of the work given in the elementary school. The aim will be to suggest ways of enriching the geography work by presenting plans which will give pupils an opportunity for self-expression. Teachers should bring with them a modern textbook in geography. Five exercises a week; four weeks.

*Miss Clark*

**Arithmetic.** — This course will include methods of presenting various types of work given in the first six grades. Lessons will

be presented and there will be opportunity for free discussion about real difficulties which are presented in the study of this subject in the classroom. Five exercises a week; four weeks.

*Miss Clark*

**Teaching of Mathematics in Secondary Schools.** — A course in which the subject matter of arithmetic, elementary algebra, and plane geometry is considered, also methods of presenting the different topics in the classroom, and devices for creating interest in mathematics. Special attention will be given to content of courses and classroom methods for junior high school mathematics. Five lectures per week.

*Professor Machmer*

**French and Spanish.** COURSE I. French. — As in 1920 Announcement, given in 1920, to be given in 1922.

COURSE II. FRENCH. — A study of the prose works of Victor Hugo. Textbook, Hugo's "Notre Dame de Paris." Collateral readings from Hugo's other prose works, from Mabilleau's "Victor Hugo," and from other critical works in the library. Five hours a week; four weeks. (To be given in 1921.)

COURSE III. SPANISH. — As in Course II, Spanish, in 1920 Announcement; given in 1920, to be given in 1922.

COURSE IV. SPANISH. — Elementary Spanish; intended for student-teachers who wish to gain a reading knowledge of Spanish; an outline of grammar with considerable drill in pronunciation. Textbook, Hills and Ford, "Spanish Grammar." Five hours a week; four weeks. (To be given in 1921.)

*Professor MacKimmie*

**Hygiene and Sanitation.** — Deviation from health from the normal being is disease. The human body is susceptible to deviation from health. Certain elements are responsible for the entrance of disease into the body. The body becomes weakened through exposure, lack of exercise, unsuitable food, abuses. Under such circum-

stances it lays itself open to attack. There is the attack from within, which consists of some organic derangement, and the attack from without, which makes it possible for foreign enemies, agents, or micro-organisms to enter.

Closely associated with the production of disease are intermediaries and causal factors, as ventilation, water supplies, sewage disposal, and food. They serve as vehicles for disease agents. The germs of disease find their way through them and are carried by them. Besides, human contact seems to be the most important disseminator, and insects and animals may harbor or convey and in some instances instigate disease.

Then there are those conditions which react on the body in a physical manner and influence its mechanism, its operating facilities, as mental disturbances, character of food, conditions of living.

The course will treat the following subjects: (1) the human body in health and disease; (2) micro-organisms of disease; (3) products of micro-organisms and disease production; (4) channels of infection; (5) air and health; (6) water supply; (7) sewage disposal; (8) milk supply; (9) food poisonings; (10) food infections; (11) reciprocal relation of body and causal agent of disease; (12) factors of resistance; (13) vaccines; (14) use of sera, etc.; (15) infectious diseases; (16) infectious diseases; (17) isolation and disinfection; (18) principles of personal hygiene; (19) public health organization; (20) health, — a private and public asset. This course is especially designed to meet the needs of public schools. Demonstrations and lectures. Five hours per week; four weeks.

*Professor Marshall*

**Trees and Shrubs.** — A study of our cultivated trees and shrubs and such of our native material as may well be introduced into home planting. Special consideration will be given to their identification, propagation, uses, and care. Five exercises a week; four weeks.

*Professor Thompson*

## **COURSES FOR TEACHERS OF AGRICULTURE**

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A series of special courses for teachers of agriculture has been arranged by the Division of Vocational Education and the Massachusetts Agricultural College. These courses deal with supervision and administration of agricultural education, teacher training, principles and methods of teaching, vocational education, and professional improvement problems. The instruction in these courses will be supplemented by lectures given by specialists from other States and from the Federal Department.

1. 51. Principles and Methods of Teaching
2. 76. Special Methods in Vocational Agricultural Teaching
3. 103. Professional Improvement Problems
4. 104. Supervision and Administration of Agricultural Education
5. 108. Vocational Education



## INSTITUTE FOR ADVANCED STUDY IN AGRICULTURAL EDUCATION

June 27 to July 23

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The first rush in the teaching of vocational agriculture is over. Under the new national program of this work the most serious handicap was the item of properly equipped teachers. Work began, however, in the best way possible with the best teaching force obtainable. The first concern was to get the work started in some fashion. We are settling now into relatively well-defined lines of work and fixed ideals for teachers. The next step in the development of agricultural teaching will be the improvement and standardization of apprentice teaching and the guidance of those entering service for the first time. From now on in the development of vocational agricultural instruction the fitting of the teacher becomes more and more imperative. It is evident to any one that the best prepared teacher will be the one to stand at the head of the line before the door of opportunity through which promotion is possible.

Recognizing the status of this work as indicated above, it follows that institutions which can do so must provide every opportunity for prospective, ambitious candidates and teachers in service to prepare for promotion when the opportunity comes. Part of this preparation lies in acquiring greater skill for doing the present work better, part in forming higher ideals for inspiration, and part in getting new concrete ideas for the daily tasks. There is needed also the wider outlook upon the State and National work of which the individual's local efforts form a part.

No State would wish its present complement of agricultural teachers to be satisfied to continue as such, devoid of ambition to occupy some day the superior positions in the administrative and

teacher-training phases of the program of agricultural education. In other words, it would be a very short-sighted policy not to furnish opportunity for training men who will some day be called upon to fill these more advanced positions.

For these reasons the Massachusetts Agricultural College, in co-operation with the Division of Vocational Education of the State Department of Education, offers courses in agricultural education at the College for the improvement of agricultural teaching. These courses are aimed directly at the things a man in the position of director, supervisor, educational manager, and teacher-trainer must know and be able to do in order to carry on the work of his position successfully. These courses are full of the experience and best judgment of men who have made good in the positions concerned. The lectures and discussions in these courses cover the duties, problems, and possibilities of the various types of positions in agricultural education.

The courses are open to men now employed in advanced positions who feel the need of adding to their stock of information and inspiration and to teachers of agriculture who are looking for advancement. They are of especial value to high school teachers, union superintendents, and city superintendents who contemplate making agriculture an integral part of their school work.

College credit may be earned as stated under the individual courses which follow.

**51. Principles and Methods of Teaching.** — Methods of teaching should be based on principles of teaching. Principles of teaching are based on the laws of learning. The chief emphasis of the work in this course is placed upon the learning processes. Special consideration will be given to spontaneous or involuntary noting, purposeful or voluntary observation, apperception, remembering, analysis and synthesis, judging and reasoning, interest, etc. These and other activities, both mental and physical, will be presented as mental processes from the standpoint of psychology, and

also as learning processes from the standpoint of teaching. Five hours per week; four weeks.

Undergraduate credit may be earned in this course by the satisfactory completion of work equivalent to a college term of twelve weeks.

*Professor Hart*

### **76. Special Methods in Vocational Agricultural Teaching.**

— This course covers the special problems that face the teacher of agriculture and some ways of meeting them. It deals with the essential duties of the special teacher and his opportunities. Much attention is given to the organization of a teaching attack in definite topics of study. The effort is made to keep teaching plans consistent with the recognized principles of learning required in the mastery of a vocation. Five hours per week; four weeks.

Undergraduate credit may be earned in this course on conditions stated under 51.

*Professor Welles*

**103. Professional Improvement Problems.** — The name of this course indicates its adaptation to special needs of the particular people in the group. The subject matter varies from one season to another. It is a seminar course primarily for employed teachers and directors of vocational agriculture (prospective candidates admitted). It deals with the Massachusetts system as it is and the problems confronting the instructor. It includes plans for the coming season and campaigns for improved methods based on experiences of men in service. Some of the topics hitherto discussed are "Project Study Outlines," "Farm Practice Standards," "Motivation of Study," "Meeting the Individual Differences," and "Study Note-Books."

In case a sufficient number of both experienced and untrained men apply for this course, the group may be divided into two sections. Five double periods each week for the first two weeks; five single periods each week for the remainder of the term.

*Mr. Heald*

**104. Supervision and Administration of Agricultural Education.** — This course covers such problems as have to be met by educational managers, State directors, and supervisors of agricultural education in order to maintain the efficiency of this work in the State. It deals with the inter-relations of the work of teachers and administrators. This course is open to men now engaged in administrative or supervisory capacities, and to those who wish to become so engaged in the future. Detailed study will be made of the following topics: "Supervision Plans," "School Survey and Check," "Massachusetts Plan of Supervision," "Teachers and Teaching," and "Phases of Teacher-Training." Five hours per week; four weeks.

*Mr. Heald*  
*Professor Welles*

**108. Vocational Education.** — The work of this course is based on a textual study of the Smith-Hughes act and other Federal laws having a direct bearing upon vocational education; State laws supplementing Federal laws; policies and rulings of the Federal Board for Vocational Education, and State plans of administering both State and Federal laws designed to promote vocational education. The study of the foregoing material will be accompanied by discussions of the economic social and educational principles which are involved in and which actuate the whole program of vocational education. Five hours per week; four weeks.

Graduate credit may be earned in courses 103, 104, and 108 by persons eligible to and registered in the graduate school of the Massachusetts Agricultural College. Credit may be cumulative from year to year.

*Professor Hart*

### **Additional Lectures**

In addition to members of the College staff and of the State Department of Education, a number of prominent men who are now engaged in the various phases of vocational and agricultural education will contribute materially to the richness of the courses outlined above. The selection of these men is dictated entirely by the marked successes they have attained in their respective fields. The list includes men connected with the various State administrations as well as representatives of the Federal Board for Vocational Education.

## TWO-YEAR COURSE — SUMMER TERM

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A special course arranged for students sent to the College by the Federal Board for Vocational Education is given during the summer.

**S-2. Principles of Feeding.** (First year, second term, required.) — A study of the fundamental principles of animal nutrition, of the composition and quality of feeding materials and their relative importance for the different classes of farm animals. The latter part of this course will be devoted to a study of feeding standards and the calculation of rations. Textbook: Henry and Morrison, "Feeds and Feeding." Three class hours a week. Credits, 3.

*Mr. Tirrell*

**S-2. Fruit Growing.** (First year, second term, required.) — This course will deal with questions concerning the establishing and maintaining of fruit plantations.

It will include a full discussion of the choice of a site for the plantation. Many an orchard has failed simply because it was put in the wrong place; on another site on the same farm it might have been a conspicuous success.

The soil preferences of varieties of fruits will be considered so that the student may avoid setting Rhode Island greenings where Baldwins should be grown, or Spies where Hubbardstons should stand.

The culture of fruit plantations will be considered, and the comparative value of sod and cultivation presented. Each system has its advantages and disadvantages. What are they, and under what conditions should each system be used?

Orchard implements will be discussed, examined, and tested in order that the student may see for himself their good and bad points.

The question of cropping orchards will be discussed; whether it is best to grow corn and beans and potatoes in the orchard, or to allow the trees to use all the land.

This course is required of all students. Three class hours a week. Credits, 3.

*Pomology Department*

**S-2. Dairy — Milk Testing.** (First year, first term or second term, required.) — This course takes up the question of the importance of dairying in the United States, and especially in the New England States, giving the development of dairying from the earliest to the present time. It covers the secretion, composition, and properties of milk; reasons for variation in the per cent of fat in different samples of milk; the Babcock test for fat in milk and other dairy products; other common milk tests; and shows the advantage of testing herds, cow tests associations, advanced registry work, etc. The laboratory work consists mainly in testing milk and dairy products for butter fat, solids, acidity, preservatives, etc. Two class hours and one three-hour laboratory period per week. Credits, 3.

*Professor Yaxis*

**S-2. Poultry.** (First year, second term, required.) — This course covers opportunities in poultry culture, geographical distribution, classes, breeds, and varieties, incubation and brooding, growing stock, diseases, marketing poultry and poultry products, feeding for egg and meat production, and poultry farm management. Textbook: Lewis, "Productive Poultry Husbandry." Three class hours per week. Credits, 3.

*Mr. Burke*

**S-2. Farm Arithmetic.** (First year, second term, elective.) — During the second term the course includes the elements of book-keeping, commercial papers, etc. Three hours per week. Credits, 3.

*Professor Machmer*

**S-4. Farm Machinery.** (First year, first term, elective.) — This course is a study of the selection, use, and care of field implements, pumps, windmills, and miscellaneous farm equipment. Instruction is given by lectures, textbook, and actual work on the implements in the shop and in the field. Special attention is given to the repair and maintenance of equipment. One class hour and two two-hour laboratory periods per week. Credits, 3.

*Professor Gunness*

Other courses will be organized as needed.



## UNIT COURSES

June 27 to August 27

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These courses are designed especially for ex-service students whose previous education has been limited. When demobilization was begun the College immediately organized special six weeks' courses for returning soldiers, sailors, and marines. From these special six weeks' courses the month to month courses, known as the Unit Courses, have been developed. There are no entrance examinations nor entrance requirements. The courses are so arranged that practically every one, regardless of previous education, age, or experience, may be accommodated. The work in each subject begins each month during the College year. Special emphasis is placed on English and arithmetic, since they are the greatest needs of the men enrolled in these courses. In addition to English and arithmetic, courses are provided in agronomy, animal husbandry, dairying, general agriculture, gas engines, pomology, poultry, and vegetable gardening. A student enters the agricultural Unit Courses if his previous education is not sufficient to permit of his taking up the work of the Two-Year Course.

In connection with the Unit Courses there is much actual practice on the farms, orchards, gardens, in the dairies, barns, shops and greenhouses, and with poultry, live stock and farm machinery.

Unit Courses will be offered in the following subjects during July and August: —

Agronomy  
Animal Husbandry  
Dairying  
General Horticulture

Fruit  
Vegetable Gardening  
Poultry  
Farm Mechanics

## SHORT COURSES AT THE MASSACHUSETTS AGRICULTURAL COLLEGE

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The Massachusetts Agricultural College offers through its short course administration the following schools and courses:—

The Two-Year Course in Practical Agriculture  
The Ten Weeks' Winter School  
The Summer School  
The One-Year Vocational Poultry Course  
The Course for Country Clergymen

### The Two-Year Course

The Two-Year Course in Practical Agriculture is designed for young men and women, seventeen years of age or over, who have at least a common school education. This course was begun in December, 1918, with an enrollment of 37 students. The small enrollment was due to the fact that young men of military age were subject to the draft. Two hundred eighty-two students have enrolled this year.

The first year consists of six months of study at the College, beginning with the College fall term and closing with the winter term of the regular session. At the close of six months of study students are required to gain six months of farm practice. The College will assist students in finding positions where the experience gained will be of great advantage. During the second year the students spend nine months in resident study.

This course will appeal not only to young men and women but also to men and women of mature years and practical experience who wish to know more about the business of farming. Although the course is planned to meet the needs of those who are not grad-

uates of high schools, the instruction is not preparatory or elementary in its nature, but is so arranged that it will be of value to all. The greater amount of academic training that some of the students may possess will in a measure be offset by the fund of practical knowledge possessed by many who have completed only the elementary schools.

Further information concerning this course may be had from the Director of Short Courses.

## A ONE-YEAR VOCATIONAL COURSE IN POULTRY HUSBANDRY

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To meet the needs of those who wish to specialize in this branch of agriculture and who feel that they cannot spend two or four years in doing it, a special One-Year Vocational Poultry Course in Poultry Husbandry has been organized. This course includes poultry, feeding, brooding, management, judging, marketing and diseases. It covers in a thorough way all phases of the work with which the poultrymen should be familiar. The greater part of the course consists of actual, practical experience in the poultry plant.

Applicants for this course must be at least eighteen years of age, and must have had a good elementary education. Registration for this course should be made early in view of the fact that the number is limited and the demand for it considerable. There is no tuition charged to residents of Massachusetts, but a \$5 registration fee is charged in the winter term and a \$5 registration fee in the spring.

The course begins with the winter term in January. It is limited to fifteen students. Further information may be had from the Poultry Department.

**APPLICATION FOR ENROLLMENT**

IN THE

**SUMMER SCHOOLS**

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**MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST**

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Name.....

Date of application.....

Post office.....Street.....State.....

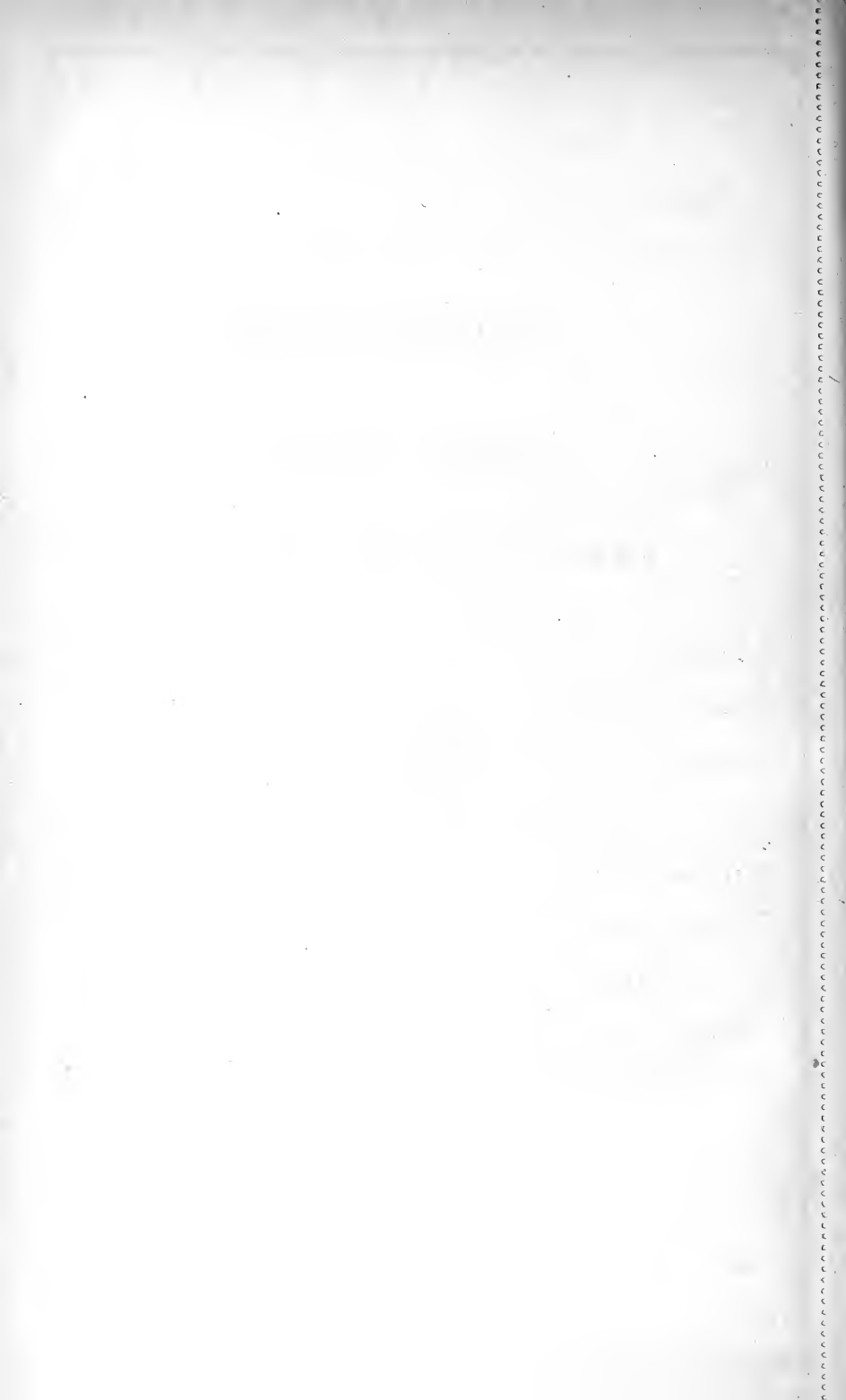
Present occupation.....

Previous education.....

Name and address of person to whom word may be sent in case of illness

or accident:.....

Mail this blank to JOHN PHELAN, Director of Short Courses, Massachusetts Agricultural College.



**MASSACHUSETTS  
AGRICULTURAL COLLEGE**

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**ANNOUNCEMENT**

**OF THE**

**TWO-YEAR COURSE IN PRACTICAL AGRICULTURE**

**1921-1922**



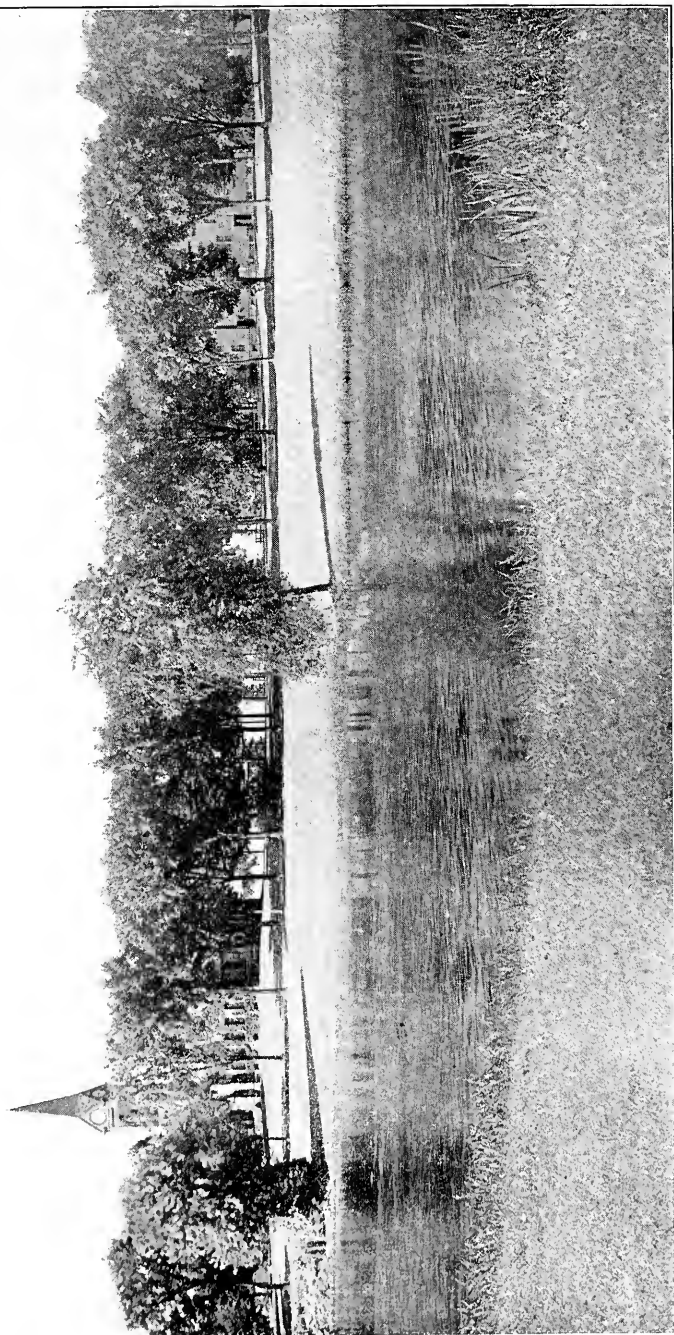
## **TWO-YEAR COURSES**

IN

1. GENERAL AGRICULTURE AND ANIMAL HUSBANDRY
2. GENERAL AGRICULTURE AND POULTRY
3. DAIRY MANUFACTURES
4. GENERAL HORTICULTURE
5. POMOLOGY
6. FLORICULTURE
7. VEGETABLE GARDENING







A View of the Campus, showing Library

# THE M. A. C. BULLETIN

Amherst, Massachusetts

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Volume XIII

SEPTEMBER, 1921

Number 6

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Published Eight Times a Year by the Massachusetts Agricultural College  
January, February, March, May, June, September, October, November

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## THE TWO-YEAR SHORT COURSE IN PRACTICAL AGRICULTURE

OF THE

MASSACHUSETTS AGRICULTURAL COLLEGE



PUBLICATION OF THIS DOCUMENT  
APPROVED BY THE  
SUPERVISOR OF ADMINISTRATION.

## CALENDAR, 1921-22

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### Two-Year Course

#### 1921

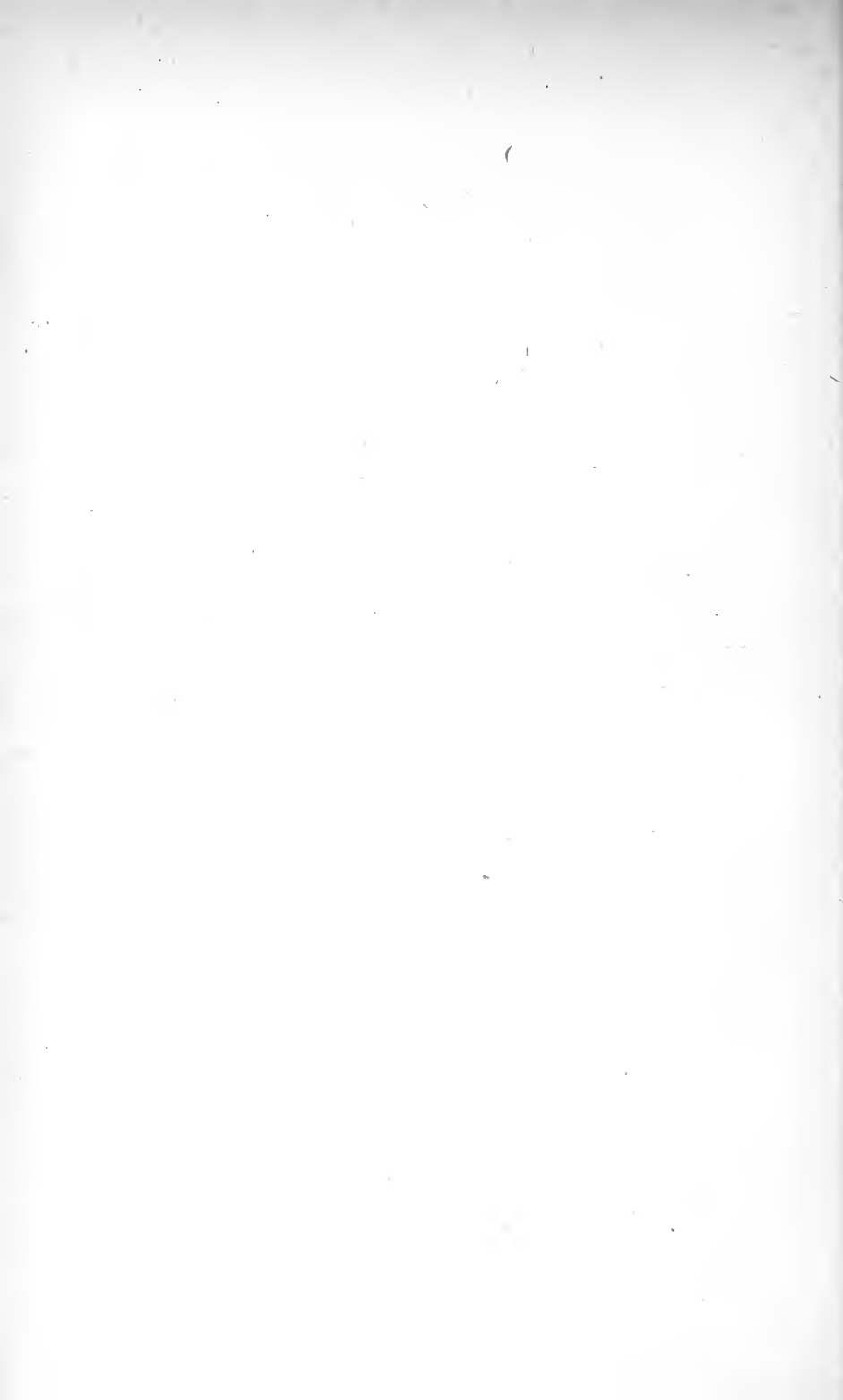
September 26, Monday	. . . . .	Examinations in English and Arithmetic <sup>1</sup> <i>2.7 2011</i>
September 27, Tuesday	. . . . .	Registration begins
September 28, Wednesday, 1.30 P.M.	. . . . .	Fall term begins; assembly
October 12, Wednesday	. . . . .	Holiday — Columbus Day
November 23-25, Wednesday, 12 M.-Friday, 1 P.M.		Thanksgiving recess
December 23, Friday, 5 P.M.	. . . . .	Fall term ends

#### 1922

January 2, Monday, 1 P.M.	. . . . .	Winter term begins
February 22, Wednesday	. . . . .	Holiday — Washington's Birthday
March 24, Friday, 5 P.M.	. . . . .	Winter term ends
April 3, Monday, 1 P.M.	. . . . .	Spring term begins
April 19, Wednesday	. . . . .	Holiday — Patriots' Day
May 30, Tuesday	. . . . .	Holiday — Memorial Day
June 16, Friday	. . . . .	Spring term closes
June 19, Monday	. . . . .	Graduation
September 27, Wednesday, 1.30 P.M.	. . . . .	Fall term begins; assembly

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<sup>1</sup> All entering students will be required to take examinations in English and Arithmetic.



## STAFF

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### Officers of General Administration

KENYON L. BUTTERFIELD, A.M., LL.D.

*President of the College*

—— ———  
*Librarian of the College*

EDWARD M. LEWIS, A.M.

*Dean of the College*

PHILIP B. HASBROUCK, B.Sc.

*Registrar of the College*

WILLIAM L. MACHMER, A.M.

*Assistant Dean of the College*

FRED C. KENNEY

*Treasurer of the College*

JOHN PHELAN, A.M.

*Director of Short Courses*

RALPH J. WATTS, B.Sc.

*Secretary of the College*

### The Faculty of Instruction

MAX F. ABELL, B.Sc. . . . . North Amherst

*Assistant Professor of Farm Management*

LUTHER BANTA, B.Sc. . . . . 70 Lincoln Avenue

*Assistant Professor of Poultry Husbandry*

ARTHUR B. BEAUMONT, Ph.D. . . . . 51 Amity Street

*Professor of Agronomy and Head of Department*

ALEXANDER E. CANCE, Ph.D. . . . . 9 Fearing Street

*Professor of Agricultural Economics and Head of Department*

WALTER W. CHENOWETH, A.B., M.Sc. . . . . North Amherst

*Professor of Horticultural Manufactures and Head of Department*

C. H. DAVIDSON, C.E. . . . . Amherst

*Instructor in Arithmetic and English*

LAWRENCE S. DICKINSON, B.Sc.	2 Farview Way
<i>Superintendent of Grounds</i>	
RALPH H. DENMAN, B.Sc.	70 Lincoln Avenue
<i>Assistant Professor of Rural Engineering</i>	
BROOKS D. DRAIN, B.Sc.	Amherst
<i>Assistant Professor of Pomology</i>	
HENRY T. FERNALD, Ph.D.	44 Amity Street
<i>Professor of Entomology and Head of Department</i>	
JAMES A. FOORD, M.Sc.	54 Lincoln Avenue
<i>Professor of Farm Management and Head of Division of Agriculture</i>	
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JOHN C. GRAHAM, B.Sc.	68 Lincoln Avenue
<i>Professor of Poultry Husbandry and Head of Department</i>	
EMORY E. GRAYSON, B.Sc.	Belchertown
<i>Instructor in Physical Education</i>	
OLGA GRIZZLE, M.Sc.	- -
<i>Instructor in Home Economics</i>	
LAURENCE R. GROSE, A.B., M.F.	45 Amity Street
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CHRISTIAN I. GUNNESS, B.Sc.	105 Butterfield Terrace
<i>Professor of Rural Engineering and Head of Department</i>	
MARGARET HAMLIN, B.A.	12 North East Street
<i>Agricultural Counselor for Women</i>	
ROY D. HARRIS	North Amherst
<i>Instructor in Vegetable Gardening</i>	
CURRY S. HICKS, B.Pd.	The Davenport
<i>Professor of Physical Education and Hygiene and Head of Department</i>	
S. C. HUBBARD	- -
<i>Foreman, Department of Floriculture</i>	



HENRY F. JUDKINS, B.Sc. . . . .	103 Butterfield Terrace
<i>Professor of Dairying and Acting Head of Department</i>	
JOHN B. LENTZ, A.B., V.M.D. . . . .	Amherst
<i>Assistant Professor of Veterinary Science</i>	
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<i>Professor of Dairying and Head of Department</i>	
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<i>Professor of Microbiology and Head of Department</i>	
JOHN B. NEWLON . . . . .	94 Pleasant Street
<i>Instructor in Rural Engineering</i>	
JAMES B. PAIGE, B.Sc., D.V.S. . . . .	42 Lincoln Avenue
<i>Professor of Veterinary Science and Head of Department</i>	
JOHN PHELAN, A.M. . . . .	5 Mount Pleasant
<i>Professor of Rural Sociology and Head of Department</i>	
GEORGE F. PUSHEE . . . . .	North Amherst
<i>Instructor in Rural Engineering</i>	
WILLIAM S. REGAN, Ph.D. . . . .	84 Pleasant Street
<i>Assistant Professor of Entomology</i>	
VICTOR A. RICE, B.S.Agr. . . . .	Woodside Avenue
<i>Assistant Professor of Animal Husbandry</i>	
WILLIAM F. ROBERTSON, B.Sc. . . . .	Amherst
<i>Instructor in Horticultural Manufactures</i>	
ROLAND W. ROGERS, B.Sc. . . . .	- -
<i>Assistant Professor of Horticulture</i>	
WILLIAM E. RYAN, B.Sc. . . . .	5 Hitchcock Street
<i>Instructor in Poultry Husbandry</i>	
SCHUYLER M. SALISBURY, B.Sc., B.S.Agr. . . . .	12 Nutting Avenue
<i>Professor of Animal Husbandry and Head of Department</i>	
WILLIAM A. SANCTUARY, B.Sc. . . . .	- -
<i>Professor of Poultry Husbandry</i>	
FRED C. SEARS, M.Sc. . . . .	Mount Pleasant
<i>Professor of Pomology and Head of Department</i>	

HAROLD F. SMART, Attorney	Nash Block
<i>Instructor in Business Law</i>	
NEWELL L. SIMS, A.M., Ph.D.	60 Pleasant Street
<i>Professor of Rural Sociology</i>	
EDNA L. SKINNER, B.Sc.	50 Lincoln Avenue
<i>Professor of Home Economics and Head of Department</i>	
RICHARD W. SMITH, B.Sc.	- -
<i>Instructor in Dairying</i>	
JAMES L. STRAHAN, M.Sc.	50 Amity Street
<i>Assistant Professor of Rural Engineering</i>	
CHARLES H. THAYER	Hickory Farm, Amherst
<i>Instructor in Agronomy</i>	
CLARK L. THAYER, B.Sc.	The Davenport
<i>Professor of Floriculture and Head of Department</i>	
WESTON C. THAYER, B.Sc.	14 Nutting Avenue
<i>Instructor in Animal Husbandry</i>	
GUY THELIN, B.Sc.	Amherst
<i>Instructor in Agronomy</i>	
CHARLES H. THOMPSON, M.Sc.	Mount Pleasant
<i>Assistant Professor of Horticulture</i>	
HAROLD F. THOMPSON, B.Sc.	10 Temple Street, Arlington
<i>Professor of Vegetable Gardening and Head of Department</i>	
PAUL W. VIETS	Kendrick Place
<i>Supervisor of Farm Placement Training</i>	
FRANK A. WAUGH, M.Sc.	Campus
<i>Professor of Landscape Gardening and Head of Division of Horticulture</i>	
T. GEORGE YAXIS, M.Sc.	Tillson Court
<i>Professor of Dairying</i>	

The above list of names of the faculty includes not only those of teachers, but also of members of the staff who bear administrative relation to the Two-Year men.

# THE TWO-YEAR COURSE IN PRACTICAL AGRICULTURE

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The Two-Year Course in Practical Agriculture was organized in 1918 to meet the demand for a thorough short course in agriculture and horticulture that might be taken by students who either did not possess college entrance requirements or who for one reason or another were unable to take the regular four-year college course. The course was reorganized in 1921, in order that it might provide specific vocational training for the particular lines of agricultural work which the students may select. When a student enrolls he is required to state the type of farming in which he expects to engage. He then pursues a specially arranged course of preparation for that type of work. This specialization does not prevent his securing a general working knowledge of other subjects in which he may be interested.

That the course meets a specific demand in this State is shown by the following table, giving the number of students enrolled each year since it was established: —

1918	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	37
1919	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	209
1920	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	280
1921	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	324

This course will appeal not only to young men and women but also to men and women of mature years and practical experience who wish to know more about the business of farming. Although the course is arranged to meet the needs of those who are not graduates of high schools, the instruction is not preparatory or elementary in its nature, but is so planned that it will be of value to all. The greater amount of academic training that some of the students may possess will in a measure be offset by the fund of practical knowledge possessed by many who have completed only the elementary schools.

The advantages of the college staff of specialists and the college plant with all its resources are thus made available to young men and young women who may not have had the opportunity of securing a high school education.

The Two-Year Course is not intended for students enrolled in high schools. Such students should finish the high school course. Students enrolled in high schools who wish to take the course should bring a statement, either from the principal of the high school or from parent or guardian, asking permission to be enrolled.

The Two-Year Course in Practical Agriculture is organized as follows: the first year consists of six months of study at the college and six months of practical farm experience; during the second year the student is required to spend nine months in resident study at the college.

The work of placing students on farms is in charge of the Supervisor of Farm Placement Training. Such farms are selected throughout the State which will enable the student to pursue the line of work he desires. Thus an effort is made to place the dairy student on a dairy farm, the student of pomology on a fruit farm, and so on. It should be clearly understood, both by the employer and by the student, that this six months of farm experience is educational in its nature. Farms are selected on the basis of the practical experience which will be gained from them by the student. This farm experience may, by special arrangement, be secured on the home farm.

The general plan of placing men is as follows: first, the students are interviewed as to the type of farm on which they are to be placed; second, the student's qualifications and general characteristics are very carefully itemized in the letter of application to the farmer for employment; third, all applications for positions are made through the Supervisor of Farm Placement Training, and each student is required to abide by all rulings made.

Each student is expected to receive a reasonable wage, and earn it. The scale of wages may vary in different localities, but each man's abilities are gone over carefully to see that he obtains a wage that is fair to him.

The students are visited in training by the Supervisor of Farm Placement Training. He may be called upon for advice, and will do all that is possible to co-operate with the individual needs of each man. A report from the employer is also received concerning the energy, natural ability, and reliability of each student in relation to his work.

In order that the work during the placement period may be a success, the Supervisor of Farm Placement Training requires the following conditions to be observed:—

1. All applications for placement must be made through him.
2. No transfers are to be made without first consulting him.
3. Before abandoning the position he must be notified, and permission received by the student.
4. A monthly report must be rendered on the form furnished, and submitted to him not later than the fifth of each month during the training period.

### **Instruction**

The instruction is given by the regular faculty by means of class-room teaching, laboratory exercises, and practical work. The work of the class-room is supplemented by demonstration work in the laboratory, dairy room, greenhouse, and stables. The library of 65,000 volumes offers exceptional opportunities for special study in agriculture, horticulture, and related sciences. The instruction is designed to offer plain, practical, direct information, and to establish the underlying reasons as well as the method employed in the various operations.

### **Entrance Conditions**

Students must be seventeen years of age or over and have completed at least an elementary school course or its equivalent. They must have had six months' practical farm experience before they will be permitted to enroll for the work of the second year. This experience may be gained after the first year of study at the college.

In order that proper arrangements may be made for accommodations, it is important to know, as accurately as possible, the number

of students who expect to attend. All persons intending to enroll in the Two-Year Course are advised to make application as early as possible to the Director of Short Courses.

An examination in English and Arithmetic is given all students. The purpose of this examination is to determine the section of English and Arithmetic in which they will receive the most benefit. Students passing the examination with a standing of 75 or over will be excused from these subjects.

English and Arithmetic are required of all entering Two-Year students unless passed off by examination.

### **Certificate**

In order to obtain a certificate a student is expected to have satisfactorily completed all of the work called for in the general course which he has selected. The basis of credits is as follows: one credit for one class hour of either recitation or lecture, and one credit for each two hours of laboratory work. The certificate is not granted to any student whose record does not show that all courses elected have been passed successfully.

At the close of the term students will receive a formal report showing the standings gained in the subjects pursued by them, provided a request to receive such a report is made to the Registrar of the college.

Upon the satisfactory completion of the Two-Year Course the student is given a certificate showing the courses he has completed and the grades attained therein.

### **How to Enroll**

1. Each student is required to file with the Treasurer of the college a statement, signed by the town (or city) clerk of the town (or city) from which he enrolls, stating that the parent or guardian of the student is a resident of that town. A blank for this purpose is inserted at the end of this catalogue.

2. First-year students plan to arrive in Amherst so as to take examinations in English and Arithmetic not later than Monday, September 26; second-year students for registration on Tuesday, September 27. For the second term classes will begin Monday, January 2.

3. Upon arrival, report at the office of the Director of Short Courses, located in South College, where information may be obtained in regard to board and room, schedule of classes, etc.

4. Make out the application for enrollment, which will be supplied by the Director of Short Courses. This enrollment may be made in advance by correspondence. Students who expect to take the courses are advised to correspond with the Director of Short Courses.

5. Present the application for enrollment at the office of the Registrar, who will issue a class card that must be signed by the (1) President, (2) Treasurer, (3) Director of Short Courses, and (4) by the instructors in whose classes the student enrolls.

6. Go to the Treasurer's office to pay laboratory fees.

7. Return the enrollment card *within one week* to the office of the Registrar. The card should have the signatures stated above.

8. Attend all general college exercises.

### **Rules and Regulations**

The Director of Short Courses shall have charge of all cases of absence.

A student may be absent from 10 per cent of chapel exercises and from 10 per cent of the assemblies in each semester.

A student may be absent from 10 per cent of class exercises, except examinations, provided he meets all the requirements of his instructors for the omitted exercises. Every absence from any class exercise in excess of those allowed shall entail a deduction from the mark obtained in the course in which the absence occurred. Unexcused absences may be sufficient cause for subjecting the student to further discipline.

Absences from exercises immediately and consecutively preceding or following a holiday, recess or vacation announced in the published calendar shall be counted as double absences. No excuse shall be considered before the number of absences allowed in any semester is exhausted.

All physicians' certificates must be approved by the Professor of Physical Education and deposited with the Director of Short Courses within three days after the last absence covered by the certificate or they will be invalid.

All applications to the Director for excuses of absence shall be made in writing and presented in person. They must, if possible, be made in advance. If they cannot be made in advance they must be made within two days after the expiration of the period of absence, and they must contain a full statement of the reason of the delay in presenting them. A blank form will be furnished at the Short Course office.

In the record of absences two tardy marks shall be considered equivalent to one absence.

Any student who absents himself from an appointed examination without sufficient cause shall be given zero thereon. In such case he shall not be entitled to a make-up examination unless the Director so requests. A previously announced test may, at the discretion of the instructor, be regarded as a test or as an examination.

Every absence taken before enrollment (the signing of the registration card by the teacher) in a class will be deducted from the student's absence allowance in that class. The Director, however, may grant the special privilege of a visitor's card.

If a student's term mark in any subject falls below 60 per cent, or if he drops a course without the consent of the Director, he is thereby *failed* (F) in that subject. He shall be debarred from taking the final examination in that subject, and must repeat it with the following class.

If the average of the term mark and the final examination is below 60 per cent, the student is thereby *conditioned* (\*).



### **Agricultural Opportunities for Women**

Agriculture is a field in which women are finding increasingly good opportunities. Poultry keeping, fruit growing, floriculture, dairying, truck farming, general farming, — all offer favorable openings for women. In all of these branches of agriculture women are farming independently. Women are also filling paid positions which include farm and estate managers and workers, garden supervisors, and workers in boys' and girls' agricultural clubs.

For the woman or girl whose home is already upon the farm the opportunity is exceptionally good. With the help of an agricultural education there are open to her many means of increasing her own or the farm income. With the knowledge of farm life which she already possesses, and with the possibility of securing occasional help from her family, she can easily carry on and develop a profitable enterprise of her own. The Two-Year Course in Agriculture will afford to the women who wish to engage in farming the practical training which they will need to fit them for their work, and will open to them new doors of opportunity. The particular problems which the women engaged in farming will have to meet, and the special lines of farming in which they will have favorable opportunities, will be considered in a series of conferences.

Women who are interested in taking agricultural courses should correspond with Miss Margaret Hamlin, who acts as adviser for agricultural courses for women. Women interested in home economics should address Miss Edna L. Skinner.

### **Positions**

The college does not guarantee positions to students registered in any of its courses, but it has an opportunity to recommend students for a large number of positions. A record is kept of each student's work and of his farm experience, and of his success in positions for which he has been recommended after he has finished his course.

The opportunities for trained men and women, especially those who have had farm experience, are exceptionally good.

A student desiring a recommendation from the college must meet the following conditions: —

- (1) He must be of good character.
- (2) His previous record must be good.
- (3) His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of farm experience cannot, as a rule, be recommended for positions of responsibility. This is especially true of the better positions for which managers or superintendents are wanted.

### **The Library**

The college library occupies the entire lower floor and basement of the Chapel-Library building. It contains more than 65,000 volumes, in addition to a large number of unbound periodicals and pamphlets. Works on agriculture, horticulture, botany, entomology, and the various sciences predominate, but literature, history, economics, and sociology are well represented and receive due attention. In addition to a few newspapers and the best farm papers, the reading room is supplied with a good variety of popular periodical literature, encyclopedias, and general reference books. The equipment is such that the library ranks extremely well with the agricultural libraries of the country.

An agricultural reference library is maintained in Stockbridge Hall. Other branch libraries and reading rooms are provided in the department buildings, and these are open for the use of the Short Course and regular college students.

The library hours are from 8 A.M. to 6 P.M. and 7 to 9.30 P.M. every week day, and from 9 A.M. to 1 P.M. on Sunday in term time. Shorter hours prevail during the vacation season.

Short Course students should be able to find splendid material for their line of college work and are cordially invited to make use of the library and its equipment. The librarian and library assistants are always on hand, ready and willing to be of assistance.

## Student Expenses

**TUITION.** — Tuition is free to residents of Massachusetts. Students who are not residents of Massachusetts are charged a tuition fee of \$60 a year. The tuition charged persons not citizens of the United States is \$120 a year. *Students entering from Massachusetts are required to file with the President a statement, signed by either town or city clerk, stating that the applicant's father is a legal resident of Massachusetts; a similar statement is required of those entering from other States.*

All students entering the college for the first time in this course are charged a matriculation fee of \$5, which in event of a student leaving the institution shall, if all bills due the college are paid, be remitted, or which shall upon graduation be considered as payment for the certificate.

Board may be obtained at the college dining hall. At present the price of board there is \$7 a week. This is subject to change.

## LABORATORY FEES

The principles observed in establishing laboratory fees are the requirement that students pay for those materials actually used which cannot be supplied by the individual, and that the laboratory fees include a charge sufficient to guard against wanton waste and breakage. Fees may be established for any course without previous announcement. At present the fees charged are as follows: —

	Per Term
Agronomy S-1 . . . . .	\$1 50
Agronomy S-2 . . . . .	2 00
Animal Husbandry S-1, S-5 . . . . .	1 50
Animal Husbandry S-4 . . . . .	1 00
Dairying S-1, S-2, S-3, S-4 . . . . .	3 00
Floriculture S-3, S-5 . . . . .	3 00
Floriculture S-6 . . . . .	2 50
Horticulture S-1 . . . . .	1 00
Horticulture S-5, S-6, S-7 . . . . .	1 50
Microbiology S-2 . . . . .	5 00
Poultry S-1, S-2, S-3, S-4, S-5 . . . . .	2 00
Rural Engineering S-1, S-2, S-3, S-4, S-5, S-6 . . . . .	1 50
Vegetable Gardening S-1, S-2 . . . . .	1 50

## INITIAL CHARGES

At the opening of the college year, before students are registered in their classes, the following charges are payable at the treasurer's office: —

	First Year	Second Year
Matriculation fee . . . . .	\$5 00	—
Board (if at college dining hall) four weeks in advance . . . . .	28 00	\$28 00
Assessment for support of Social Union . . . . .	1 50	1 50
Laboratory fees . . . . .	See page 17	See page 17
Student tax for support of athletics <sup>1</sup> . . . . .	14 00	14 00
Student tax for support of non-athletic activities <sup>1</sup> . . . . .	3 50	3 50

<sup>1</sup> While this is not essentially a college charge, the Treasurer of the college acts as collector for the student activity, and all students are expected to make the payment as indicated. The subscription price of the "Collegian" is fixed by the managers, the amount of athletic tax by vote of the student body.

The necessary college expenses are estimated as follows:—

Tuition: citizens of Massachusetts, free; other citizens of the United States, \$60 a year; foreigners, \$120 a year.

	Low	High
Matriculation fee, first year . . . . .	\$5 00	\$5 00
Room in private houses . . . . .	72 00	110 00
Board, \$7 per week . . . . .	252 00	252 00
Laundry, 50 to 85 cents a week . . . . .	18 00	30 00
Laboratory fees . . . . .	5 00	20 00
Books, stationery, and miscellaneous items . . . . .	35 00	70 00
	<hr/> \$387 00	<hr/> \$487 00

The estimate given above is for the regular college year of nine months. The estimate for six months would be approximately two-thirds of the amount stated above.

Prospective students should understand that the above estimates cover expenses which may be called strictly college expenses, and that there are other financial obligations voluntarily placed upon students which they should expect to meet. Chief among these are

class assessments and taxes levied for maintenance of various organizations, such as the Social Union, Athletic Association, weekly publications, etc. Such expenses vary from \$15 to \$30 a year. Additional financial responsibility is also assumed by students joining clubs or entering into other social activities of the college. Besides the amount necessary for clothes and traveling, the economical student will probably spend between \$400 and \$500 per year.

### **Student Aid**

**SELF HELP.** — Many students are obliged to find work of some sort to earn their way through college. It is recommended that no new student enter without having at least \$250 and preferably \$350 with which to pay his way until he can establish himself in some regular work. The college does not encourage students to enter without money in the expectation of earning their way entirely. The student will find it better either to work and accumulate money before coming to college, or to take more than two years in completing his course, or, instead, to borrow money sufficient to carry him through. No student should undertake work that interferes with his studies, and students should understand that, owing to the large number of applications for employment, no one man can receive a large amount of work at the college. A number of students find opportunities for earning money without depending upon the college to furnish them with work.

Application for student labor should be made directly to Kenyon L. Butterfield, President of the college. An applicant is required to present statements from parent or guardian and from a public official or other responsible person of the town or city in which he resides, explaining the necessity of the applicant's need of assistance. Students whose deportment or class work is not satisfactory are not likely to be continued in student labor. Opportunities for labor for Short Course men on the campus are limited to second-year men in the Two-Year Course in Practical Agriculture. Students, therefore, may find it rather difficult to obtain all the work they desire

during their first year; as a matter of fact, however, any student who is capable of doing a variety of things, and who is a competent workman, usually finds little difficulty in obtaining all the work that he can do from the outset.

### **Rooms**

Students must secure rooms approved by the college. The assignment of rooms, and the general supervision of the housing of students, is in charge of the Director of Short Courses.

Women students are expected to occupy rooms in the college dormitory and such houses or apartments as the college may provide, and board at the college dining hall. No woman student will be allowed to room in a private house without a special written permission from the Director.

### **General Exercises**

Chapel exercises are held two mornings each week. On Wednesday an afternoon assembly is held, to which some prominent layman or professional man is invited to speak. The object of these assemblies is to bring to the students discussions of topics of present-day interest. A special chapel service on Sunday is usually held during the winter months. Students are required to attend these general exercises, although the President is authorized to excuse from chapel any student who may object to attendance thereon because of his religious scruples, provided his request for excuse therefrom is endorsed by his parent or guardian.

### **Student Activities**

A large number of student organizations furnish opportunity to students for work and leadership.

The Massachusetts Agricultural College Social Union was established about fifteen years ago. All students become members of the Union by paying a small fee, and in the fall and winter months the

Union gives a series of entertainments, free to students and faculty. The Memorial Building, recently erected, will be the center of student activities. Offices for the various student organizations, including the Two-Year Student Council, will be maintained in this building. On the first floor are located a lounging room, the Memorial Room, and the offices; in the basement, bowling alleys, pool tables, store, post office, and barber shop; and on the second floor an auditorium for meetings and dances. This building was erected by the alumni, students, faculty, and friends in honor of the fifty-one "Aggie" men who gave their lives in the World War.

The Young Men's Christian Association is active both socially and religiously. A Catholic club has also been organized.

The Two-Year Council is composed of representatives of the first and second year classes. This body serves as general director of the conduct in classes of the Two-Year men, and represents before the faculty the interests of this group of students.

### **Student Relations**

The customary high standard of college men in honor, manliness, self-respect, and consideration for the rights of others constitutes the standards of student deportment.

Any student known to be guilty of dishonest conduct or practice must be reported by the instructor to the President for discipline.

The privileges of the college may be withdrawn from any student at any time if such action is deemed advisable.

It should be understood that the college, acting through its President or any administrative officer designated by him, distinctly reserves the right not only to suspend or dismiss students, but also to name conditions under which students may remain in the institution. For example, if a student is not doing creditable work he may not only be disciplined but he may also be required to meet certain prescribed conditions in respect to his studies, even though under the foregoing rules his status as a student be not affected. The same provision applies equally to the matter of absences

("cuts"). According to the rules a student is allowed a certain percentage of absences from class and other exercises. This permission, which implies a privilege and not a right, may be withdrawn at any time for any cause.

Similarly, also, it applies to participation in student activities. Though this will ordinarily be governed by the rules as already laid down, yet, if in the judgment of the college authorities a student is neglecting his work on account of these activities, the privilege of participating in them may be withdrawn for such time as is considered necessary. Moreover, it may be withdrawn as a punishment for misconduct. Prospective students or their parents may, upon application, obtain a copy of the faculty rules governing student relations to the college.

### **Infirmary**

The college maintains an infirmary for the care of sick or injured students. The buildings now available for this purpose are quite inadequate for the needs of the institution, and it is hoped that in the near future other buildings of this kind may be erected and the general equipment somewhat amplified. At present two small buildings, built especially for hospital purposes, are used for the infirmary.

The following statement outlines the plan followed in the management of the infirmary with respect to students: —

#### **MANAGEMENT OF THE INFIRMARY**

##### *Supervision*

1. The infirmary is under the *general supervision* of Dr. Charles E. Marshall, who is designated as Supervisor of the Infirmary. A resident nurse is in *immediate* charge of the infirmary.

##### *Use of Infirmary*

2. Students are <sup>5</sup>urged to go to the infirmary at any time that they are in need of the services rendered by the resident nurse or by a town physician. Inasmuch as the physical director gives special attention to all student diseases, it is to be expected that the ma-



majority of the students will go to the infirmary at his suggestion. This understanding, however, should in no way deter students from going to the infirmary voluntarily at any time.

### *General Health*

3. Students are urged to consult the physical director or the resident nurse immediately when signs of physical disorder appear. Severe attacks of cold or other forms of illness can usually be avoided if treatment is administered in the incipient stage. The purpose of the infirmary is to help maintain the general good health of the students, as well as to furnish a suitable place for professional attention in cases of severe illness or accident.

### *General Fee*

4. The infirmary fee will be at the rate of \$2 a day, and will be charged when one or more meals are obtained at the infirmary or when the student remains at the infirmary for one or more nights. A nominal charge will be made to out-patients for miscellaneous treatment of a minor character.

### *Additional Expenses*

5. In addition to the fee charged as specified in paragraph 4, the following additional expenses will be charged to the patient: —

(a) *Nurses*. — In case a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient. Such a nurse will be under the general supervision of the resident nurse.

(b) *Professional Service*. — If a student requires medical attention by a physician, he will be required to select his physician and become responsible for fees charged by the physician.

(c) *Supplies*. — Special medical supplies prescribed by a physician or nurse will be charged to the patient.

(d) *Laundry*. — Expense for personal laundry incurred by students while in the infirmary will be charged to the individual student.

## COURSE IN GENERAL AGRICULTURE

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### **Animal Husbandry**

This course is designed to prepare men to be farm superintendents, herdsmen, or practical farmers.

The department is equipped with an excellent laboratory, which has a seating capacity of 180 and which is fully adapted to the requirements. There are about 125 head of dairy cattle of various ages available for classroom work; among these are included superior representatives of the Jersey, Guernsey, Ayrshire, and Holstein breeds. There are flocks of pure-bred Shropshire and Southdown sheep of the best breeding and individuality. Considerable numbers of pure-bred Berkshire and Chester-White pigs are maintained. The college possesses pure-bred Percheron horses, besides many work teams of different types, which are available for classroom purposes.

## Animal Husbandry

### FIRST YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>
Agronomy S-1 (Soils and Fertilizers) . . .	5	Animal Husbandry S-2 (Principles of Feeding) . . .	5	All students are required to take farm placement training for six months under the direction of the Supervisor of Farm Placement Training.
Animal Husbandry S-1 (Types and Breeds) . . .	5	Poultry S-1 . . . . .	5	
Rural Engineering S-1 (Farm Engineering) . . .	5	Agricultural Economics S-1 (Marketing) . . . . .	5	
Arithmetic S-1 <sup>1</sup> . . . . .	5	English S-1 <sup>3</sup> . . . . .	5	
	20		20	
Agricultural Opportunities for Women S-1 <sup>2</sup> . . . . .	2			
	22			

### SECOND YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>	<i>Credits</i>
Animal Husbandry S-3 (Feeding Practice) . . .	5	Animal Husbandry S-4 (Herd Book Study and Animal Breeding) . . .	5	Animal Husbandry S-5 (Live Stock Management and Stock Judging) . . .	5
Pomology S-1 (Fruit Varieties) . . . . .	5	Rural Sociology S-1 (Social and Economic Problems) . . .	5	Agronomy S-2 (Crops) . . .	5
Dairying S-1 (Milk Testing) . . . . .	5	Farm Management S-1 (Farm Management and Accounts) . . . . .	5	Veterinary Science S-1 (Animal Diseases) . . . . .	5
Vegetable Gardening S-1 . . .	5	Rural Engineering S-2 (Farm Motors) <sup>4</sup> . . . . .	5	Pomology S-6 (Orchard Management) . . . . .	5
	20		20		20

<sup>1</sup> Students who are not required to take Arithmetic may elect either Forestry S-1 or Home Economics S-1.

<sup>2</sup> This course is required of women students only.

<sup>3</sup> Students who are not required to take English may elect either Business Law S-1 or Home Economics S-2.

<sup>4</sup> Women students may elect Horticultural Manufactures S-1 instead of Rural Engineering S-2.

**Animal Husbandry S-1.** (Types and Breeds.) I.

This course is a study of the history of the various breeds of cattle, swine, and horses; their origin and development; their characteristics; and a discussion of the conditions to which each breed seems best adapted. The laboratory work will give the student an opportunity to do practice judging, which will familiarize him with the different types and breeds. Textbook: Plumb, "Types and Breeds of Farm Animals."

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Animal Husbandry Department.*

**Animal Husbandry S-2.** (Principles of Feeding.) II.

A study of the fundamental principles of animal nutrition; of the composition and quality of feeding materials and their relative importance for the different classes of farm animals. The latter part of this course will be devoted to a study of feeding standards and the calculation of rations. Textbook: Henry and Morrison, "Feeds and Feeding."

5 class hours a week.

Credits, 5.

*Animal Husbandry Department.*

**Animal Husbandry S-3.** (Feeding Practice.) I.

This course will consist of a study of the feeding, care, and management of all classes of live stock, giving special attention to economic production. How to feed to get a large flow of milk, how to fatten, and how to grow breeding animals will receive proper attention. Prerequisite: Types and Breeds and Principles of Feeding. Textbook: Henry and Morrison, "Feeds and Feeding."

5 class hours a week.

Credits, 5.

*Animal Husbandry Department.*

**Animal Husbandry S-4.** (Animal Breeding and Herd-Book Study.) II.

A study of the principles involved in reproduction and improvement of farm animals; the laws of heredity and variation; the various methods of breeding, — inbreeding, line breeding, outcrossing, grading, and crossbreeding; the importance of selection; and a discussion of the needs and possibilities of improvement. Prerequisite: Types and Breeds and Principles of Feeding. Textbook: Mumford, "The Breeding of Animals."

4 class hours and 1 2-hour laboratory period a week. Credits, 5.

*Animal Husbandry Department.*

**Animal Husbandry S-5.** (Live Stock Management and Stock Judging.) III.

This course consists of laboratory work in the college barns by individual students, with handling of all classes of live stock. The course will consist of five two-hour laboratory periods, three of which will be devoted to the problems of live stock management, and two to stock judging.

5 2-hour laboratory periods a week. Credits, 5.

*Animal Husbandry Department.*

## COURSE IN GENERAL AGRICULTURE

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### Poultry

Five courses are offered by this department. One is a general course designed particularly to equip the student with the fundamental principles underlying successful poultry keeping as related especially to the farm flock. The other four courses are for the student who desires to specialize in poultry culture.

There is a broad field of opportunity for adequately trained men in the commercial handling and sale of poultry and poultry products, specialists in incubation, brooding and rearing, and assistants or managers of commercial poultry farms. Good profits and salary or wages await well-equipped persons in these and other branches of poultry work.

This department is well equipped to offer practical instruction in poultry husbandry. Our quarters and equipment in Stockbridge Hall provide ample facilities for efficient classroom and laboratory teaching.

Our practical laboratory (college poultry plant) comprises about 1,200 adult birds, divided into some 30 pens of various designs, the flocks ranging in size from 10 to 100 birds; two incubators, as well as two mammoth machines; brooding and rearing facilities for 5,000 chicks, including many styles of stove, kerosene, and electric heaters; facilities for practice in pen management, fattening, killing, picking, caponizing, judging, mixing ration, construction of poultry houses and appliances, etc.

In addition to the actual practice work performed, the student has an opportunity to keep under observation practical experiments and demonstrations continually under way for the instruction of students and practical poultry keepers.



**A Class in Egg Packing**



**Two-Year Course Men testing Soil**





## Poultry

### FIRST YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>
Agronomy S-1 (Soils and Fertilizers) . . . . .	5	Animal Husbandry S-2 (Principles of Feeding) . . . . .	5	All students are required to take farm placement training for six months under the direction of the Supervisor of Farm Placement Training.
Animal Husbandry S-1 (Types and Breeds) . . . . .	5	Poultry S-2 . . . . .	5	
Rural Engineering S-1 (Farm Engineering) <sup>1</sup> . . . . .	5	Rural Sociology S-1 (Social and Economic Problems) . . . . .	5	
Arithmetic S-1 <sup>2</sup> . . . . .	5	Rural Engineering S-3 (Carpentry) <sup>4</sup> . . . . .	2	
	20	English S-1 <sup>5</sup> . . . . .	5	
Agricultural Opportunities for Women S-1 <sup>3</sup> . . . . .	2		22	
	22			

### SECOND YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>	<i>Credits</i>
Poultry S-3 . . . . .	6	Poultry S-4 . . . . .	6	Poultry S-5 . . . . .	6
Agricultural Economics S-1 (Marketing) . . . . .	5	Animal Husbandry S-4 (Herd Book Study and Animal Breeding) . . . . .	5	Agronomy S-2 (Crops) . . . . .	5
Horticultural Manufactures S-1 . . . . .	5	Veterinary Science S-1 (Animal Diseases) . . . . .	5	Pomology S-6 (Orchard Management) . . . . .	5
Pomology S-1 (Fruit Varieties) . . . . .	5	Farm Management S-1 (Farm Management and Accounts) . . . . .	5	Entomology S-1 (Beekeeping) . . . . .	5
	21		21		21

<sup>1</sup> Women students may elect Dairying S-1 in place of Rural Engineering S-1.

<sup>2</sup> Students who are not required to take Arithmetic may elect Forestry S-1, Vegetable Gardening S-1, or Home Economics S-1.

<sup>3</sup> This course is required of women students only.

<sup>4</sup> Students may elect Rural Engineering S-4 in place of Rural Engineering S-3.

<sup>5</sup> Students who are not required to take English may elect either Business Law S-1 or Home Economics S-2.

**Poultry S-1.** (General Course in Poultry Husbandry.) II.

This course is designed for those who are preparing to handle a farm flock as a more or less important side line to other agricultural operations. Students taking this course will not be allowed to take any other courses in poultry husbandry. The following subjects will be emphasized in this relationship: utility classification of fowl, — their housing, feeding, hatching, brooding and rearing, culling, marketing, disease control, and efficient management.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Poultry Department.*

**Poultry S-2.** II.

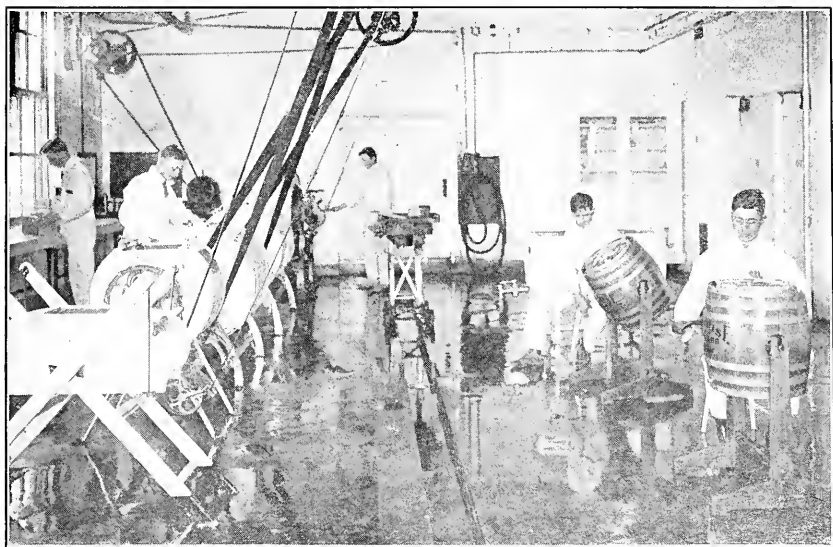
Poultry keeping as a national industry; its importance and geographical distribution; opportunities and possibilities in poultry culture in Massachusetts; principles of feeding; utility classification of fowl; incubation, both natural and artificial; the production and packing of hatching eggs; the baby chick industry; and brooding and rearing. Practical exercises will be closely correlated with the classroom work. These will include the identification of many breeds and varieties, studies of various types and sizes of incubators, brooders, and brooder houses.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

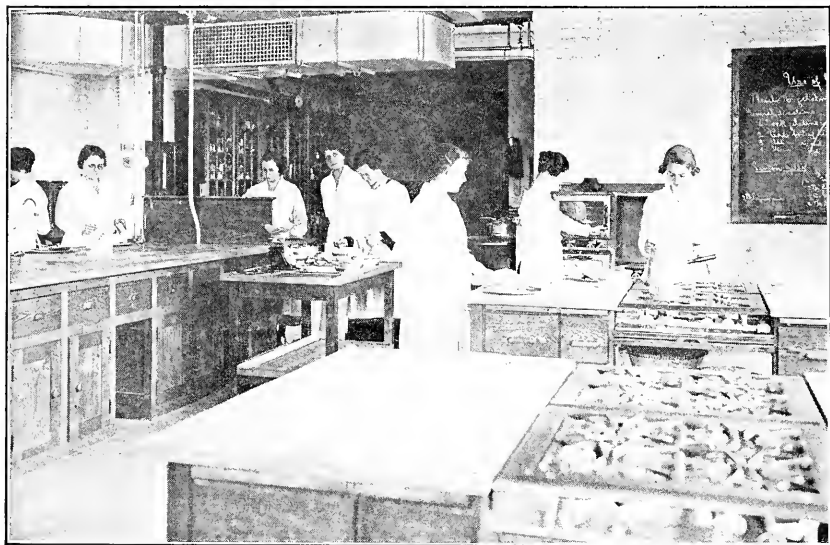
*Poultry Department.*

**Poultry S-3.** I.

Types, breeds, varieties, — their origin and development; poultry judging; utility — for eggs, meat, and constitutional vigor; exhibition — for fancy showroom characteristics by score card and comparison; fattening, killing, dry and scald picking, drawing, shaping, packing, and boning; judging of dressed fowl; market classifications of poultry, eggs, and feathers; the requirements of various markets and relative merits of different systems of marketing. Practical exer-



**Making Butter**



**A Class in Cooking**



cises will also be provided in all of the above subjects. A trip will be taken to one of the leading Connecticut Valley poultry shows. Opportunity will also be presented each member of the class to fit entries for the Market Poultry Show, held each year as part of the activities of the poultry students of the college.

4 class hours and 2 2-hour laboratory periods a week. Credits, 6.

*Poultry Department.*

#### **Poultry S-4. II.**

Anatomy and physiology of the domestic fowl; feeding practices for growth, egg production, and fattening. Efficient use of artificial illumination for high winter egg production; poultry houses and fixtures, the principles of their design and construction; poultry breeding principles and practices, value of egg-laying contests, certification and advanced registry projects, etc. In addition to practice periods in connection with the above topics, practical experience will be provided in operating both small lamp heaters and mammoth incubators.

4 class hours and 2 2-hour laboratory periods a week. Credits, 6.  
(One laboratory period offered by arrangement.)

*Poultry Department.*

#### **Poultry S-5. III.**

Caponizing; candling, grading, packing, and preserving eggs; diseases, parasites, and poultry farm sanitation; care and management of ducks, geese, and turkeys; study of the more important poultry records and accounts; advertising and poultry farm management. Practical experience will be afforded in brooding and rearing a flock of chicks under commercial conditions. One or more observational trips will be made to successful commercial poultry farms and related plants.

4 class hours and 2 2-hour laboratory periods a week. Credits, 6.

*Poultry Department.*

## COURSE IN DAIRY MANUFACTURES

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The course in dairy manufactures is designed to fit men for positions with market milk concerns, creameries, ice-cream factories, and specialized dairy farms. It is limited to 12 students.

The dairy work is given in Flint Laboratory, a modern building designed especially for dairy work and equipped with the newest and best types of dairying machinery.

The pasteurizing room contains a milk clarifier, cooler, and two 200-gallon vat pasteurizers. There is an ample and modern sterilizing outfit and a large and very well-equipped refrigerating plant.

The room designed for cheese making contains double-jacketed vats, cheese mixer, and draining racks, presses, etc. The butter-making room is well equipped with power and hand churns of various types, scales, and other accessories.

In the starter-making room there is a 50-gallon double-jacketed vat, a 100-gallon vat pasteurizer, a 50-gallon starter can, and other smaller ones.

The separator room has a complete equipment of power and hand separators, milk heater, Babcock tester, sterilizer, etc.

The testing laboratory contains all necessary apparatus, both steam and hand, for Babcock testing, and individual apparatus necessary for each student.

## Course in Dairy Manufactures

### FIRST YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>
Dairying S-1 (Milk Testing)	5	Microbiology S-2 (Dairy Bacteriology)	5	All students are required to take farm placement training for six months under the direction of the Supervisor of Farm Placement Training.
Animal Husbandry S-1 (Types and Breeds)	5	Animal Husbandry S-2 (Principles of Feeding)	5	
Microbiology S-1 (Sanitation and Hygiene)	5	Rural Engineering S-2 (Farm Motors)	5	
Rural Engineering S-4 (Repair of Farm Equipment)	2	English S-1 <sup>2</sup>	5	
Arithmetic S-1 <sup>1</sup>	5		20	
	22			

### SECOND YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>	<i>Credits</i>
Dairying S-2 (Milk Products)	10	Dairying S-3 (Market Milk)	10	Dairying S-4 (Butter Making)	10
Rural Engineering S-5 (Dairy Mechanics)	5	Veterinary Science S-1 (Animal Diseases)	5	Farm Management S-1 (Farm Management and Accounts)	5
Animal Husbandry S-3 (Feeding Practice)	5	Rural Sociology S-1 (Social and Economic Problems)	5	Agricultural Economics S-1 (Marketing)	5
	20		20		20

<sup>1</sup> Students who are not required to take Arithmetic may elect Rural Engineering S-1.

<sup>2</sup> Students who are not required to take English may elect Business Law S-1.

**Dairy S-1. (Milk Testing.) I.**

This course takes up the question of the importance of dairying in the United States, and especially in the New England States, giving the development of dairying from the earliest to the present time. It covers the secretion, composition, and properties of milk; reasons for variation in the per cent of fat in different samples of milk; the Babcock test for fat in milk and other dairy products; other common milk tests; the advantage of testing herds, cow test associations, advanced registry work; the handling of market milk; soft cheese making, ice-cream making, and butter making as applied to general farm conditions. The laboratory work consists mainly in testing milk and dairy products for butter fat, solids, and acidity, together with some laboratory work in milk handling, butter making, cheese making, and ice-cream making.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Dairy Department.*

**Dairy S-2. (Milk Products.) I.**

This course is mainly on soft cheese and ice-cream making, but includes some lectures on the manufacture of other milk products, such as artificial buttermilk, casein, condensed milk, milk powder, etc. It deals primarily with the up-to-date methods of making ice cream and various kinds of soft cheese, such as pimento, olive, nut, Neufchâtel, cottage, etc., and shows how a product of good quality can be made either as a means of marketing the entire milk supply or utilizing the surplus. Considerable attention is given to different methods of preparation for marketing. The laboratory work consists in the making of ice cream and various forms of soft cheese.

4 class hours and 4 3-hour laboratory periods a week. Credits, 10.

*Dairy Department.*



**Dairy S-3. (Market Milk.) II.**

This course takes up the history of market milk, its food value and use. Attention is given to the necessary essentials in producing a clean product; the economics of milk production; the advantages of co-operative milk producers' organizations; the various methods of marketing milk; clarification; pasteurization; cooling, etc. The laboratory work consists in visiting dairy herds and city milk plants; the operation of machinery used in connection with market milk work.

4 class hours and 4 3-hour laboratory periods a week. Credits, 10.

*Dairy Department.*

**Dairy S-4. (Butter Making.) III.**

This course covers the various methods of separating milk; the history, selection, care, and use of cream separators; the pasteurization and ripening of cream; testing of acidity in cream; the making and use of starters; a study of churns and churning; up-to-date methods of making butter; marketing butter, and tests for moisture and salt in butter. The laboratory work consists in the actual operation of separators and churns.

4 class hours and 4 3-hour laboratory periods a week. Credits, 10.

*Dairy Department.*

## COURSE IN GENERAL HORTICULTURE

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The object of this course is to train men for positions as superintendents or foremen in parks or on private estates, or as foremen for landscape gardeners, or for private practice in horticultural service, including so-called tree surgery and city forestry.

Ample classrooms and laboratories with necessary equipment are provided for all work that must necessarily be done indoors. The extensive college campus, with its stretches of lawn, its plantings of trees, shrubs, and vines, its drives and walks, furnishes an outdoor laboratory where the student will be brought into personal relation with problems comparable in every way with those that arise in the management of a park, private estate, etc. Work with various types of horse power, motor power and hand machinery and implements will give him practical knowledge of their use, care, and application. A growing nursery furnishes opportunity for the propagation and culture of those plants used in ornamenting grounds, the transplanting of these about the grounds in compliance with prepared landscape plans, and their subsequent care, including proper methods of pruning.

## Course in General Horticulture

### FIRST YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>
Pomology S-1 (Fruit Varieties) . . . . .	5	Horticulture S-1 (Plant Propagation) . . . . .	5	All students are required to take farm placement training for six months under the direction of the Supervisor of Farm Placement Training.
Vegetable Gardening S-1 . . . . .	5	Forestry S-1 (Woodlot Management) . . . . .	5	
Floriculture S-1 (Garden Flowers and Bedding Plants) . . . . .	5	Rural Engineering S-2 (Farm Motors) <sup>3</sup> . . . . .	5	
Arithmetic S-1 <sup>1</sup> . . . . .	5	English S-1 <sup>4</sup> . . . . .	5	
	20		20	
Agricultural Opportunities for Women S-1 <sup>2</sup> . . . . .	2			
	22			

### SECOND YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>	<i>Credits</i>
Horticulture S-2 (Plant Materials) . . . . .	5	Horticulture S-3 (Plant Materials) . . . . .	5	Horticulture S-4 (Plant Materials) . . . . .	5
Horticulture S-5 (Construction and Maintenance) . . . . .	5	Horticulture S-6 (Construction and Maintenance) . . . . .	5	Horticulture S-7 (Construction and Maintenance) . . . . .	5
Rural Sociology S-1 (Social and Economic Problems) . . . . .	5	Microbiology S-1 (Sanitation and Hygiene) . . . . .	5	Floriculture S-6 (Greenhouse Management) . . . . .	5
Rural Engineering S-3 (Carpentry) <sup>5</sup> . . . . .	2	Elective . . . . .	5	Elective . . . . .	5
Agronomy S-1 (Soils and Fertilizers) . . . . .	5		20		20
	22	<i>Electives</i>		<i>Electives</i>	
		Poultry S-1 . . . . .	5	Entomology S-1 (Beekeeping) . . . . .	5
		Horticultural Manufactures S-1 . . . . .	5	Pomology S-6 (Orchard Management) . . . . .	5

<sup>1</sup> Students who are not required to take Arithmetic may elect Rural Engineering S-1.

<sup>2</sup> This course is required of women students only.

<sup>3</sup> Women students may elect Poultry S-1 in place of Rural Engineering S-2.

<sup>4</sup> Students who are not required to take English may take Business Law S-1.

<sup>5</sup> Students may elect Rural Engineering S-4 in place of Rural Engineering S-3.

**Horticulture S-1.** (Plant Propagation.) II.

This course sets forth the principal and best methods used in reproducing and increasing the number of those plants cultivated in the various branches of horticulture.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Horticulture Department.*

**Horticulture S-2.** (Plant Materials.) I.

The object of this course is to learn to know the trees, shrubs, and vines used in ornamental planting, — their names, their individual characteristics as to foliage, fruit, and dormant twig features, and their habits of growth.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Horticulture Department.*

**Horticulture S-3.** (Plant Materials.) II.

This course will deal with plant associations in nature and the application of the principles governing such association to the ornamental arrangement of cultivated plants.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Horticulture Department.*

**Horticulture S-4.** (Plant Materials.) III.

A continuation of Horticulture S-3, giving special attention to foliage and flower characters and flowering habits of the plants. In addition, a study will be made of the evergreens and their uses.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Horticulture Department.*

**Horticulture S-5.** (Construction and Maintenance.) I.

Particular stress will be given to fall pruning of shrubs, together with their preparation for winter, also fall transplanting of shrubs. In addition, instruction will be given in elementary tree surgery and in walk and road maintenance.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Horticulture Department.*

**Horticulture S-6.** (Construction and Maintenance.) II.

In this term cost analyses and various park systems of maintenance will be discussed, together with park appliances, also winter pruning, snow removal, and winter protection of shrubs.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Horticulture Department.*

**Horticulture S-7.** (Construction and Maintenance.) III.

Especial attention will be given to spring pruning, lawn mowing, and lawn construction and maintenance. Tree surgery, walk and road construction and maintenance, together with weed eradication, will be studied.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Horticulture Department.*

## COURSE IN POMOLOGY

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The courses in fruit growing have been arranged with a view to training the student for work on a farm on which the growing of fruit is the leading branch of farming. As will be seen, he gets a fair training in many other lines of farm work, but the emphasis is on fruit.

It is hoped that students who have completed this work, and who have supplemented it with a sufficient amount of practical experience on the farm, will be fitted to take up fruit farming for themselves, or to manage fruit farms or fruit departments for others.

In all of this fruit work the emphasis is on the practical side, with only enough of the science and theory involved to make the student a more efficient man or woman. If the question under consideration is the healing of wounds made in pruning fruit trees, the student is given a brief discussion of the scientific principles involved, and is then taken into the orchard and required to do pruning in such a way that the wounds made will heal most satisfactorily. If it is a question of how to prune a grapevine to insure the maximum crop, the method of bearing in the grape and the various systems of pruning are discussed in the classroom, and the student is then taken into the vineyard and studies the vine to see where it bore last year, and then prunes it under expert supervision.

The Department of Pomology has 50 acres of orchard of various ages and methods of arrangement, including all the principal fruits; 5 acres of vineyards in which are shown the principal types of trellis and the leading methods of training grapes; several acres of small fruits; and a good equipment of orchard and nursery tools of all the principal types, enabling students to learn the value of each type. For orchard operations, such as spraying and pruning, the most approved makes of pumps, nozzles, pruning saws, knives, etc., are provided.

## Course in Pomology

### FIRST YEAR

<i>Fall Term</i>	<i>Credits</i>
Pomology S-1 (Fruit Varieties) . . . . .	5
Vegetable Gardening S-1 . . . . .	5
Agronomy S-1 (Soils and Fertilizers) . . . . .	5
Arithmetic S-1 <sup>1</sup> . . . . .	5
	20
Agricultural Opportunities for Women S-1 <sup>2</sup> . . . . .	2
	22

<i>Winter Term</i>	<i>Credits</i>
Pomology S-2 (Orchard Production) . . . . .	5
Horticulture S-1 (Plant Propagation) . . . . .	5
Poultry S-1 or S-2 . . . . .	5
English S-1 <sup>3</sup> . . . . .	5
	20

### *Spring Term*

All students are required to take farm placement training for six months under the direction of the Supervisor of Farm Placement Training.

### SECOND YEAR

<i>Fall Term</i>	<i>Credits</i>
Pomology S-3 (Harvesting, Marketing) . . . . .	5
Rural Engineering S-6 (Orchard Machines and Structures) . . . . .	5
Animal Husbandry S-1 (Types and Breeds) <sup>4</sup> . . . . .	5
Elective . . . . .	5 or 6
	20 or 21
<i>Electives</i>	
Poultry S-3 . . . . .	6
Dairying S-1 (Milk Testing) . . . . .	5
Horticultural Manufactures S-1 . . . . .	5

<i>Winter Term</i>	<i>Credits</i>
Pomology S-4 (Orchard and Vineyard Pruning) . . . . .	5
Animal Husbandry S-2 (Principles of Feeding) . . . . .	5
Rural Sociology S-1 (Social and Economic Problems) . . . . .	5
Rural Engineering S-3 (Carpentry) <sup>5</sup> . . . . .	2
Elective . . . . .	5 or 6
	22 or 23

<i>Spring Term</i>	<i>Credits</i>
Pomology S-5 (Spraying) . . . . .	5
Pomology S-6 (Orchard Management) . . . . .	5
Agronomy S-2 (Crops) . . . . .	5
Elective . . . . .	5 or 6
	20 or 21

### *Electives*

Poultry S-5 . . . . .	6
Horticultural Manufactures S-2 . . . . .	5
Entomology S-1 (Beekeeping) . . . . .	5

<sup>1</sup> Students who are not required to take Arithmetic may elect either Forestry S-1 or Home Economics S-1.

<sup>2</sup> This course is required of women students only.

<sup>3</sup> Students who are not required to take English may elect either Business Law S-1 or Home Economics S-2.

<sup>4</sup> Women students may elect Dairying S-1 in place of Animal Husbandry S-1.

<sup>5</sup> Students may elect Rural Engineering S-4 in place of Rural Engineering S-3.

**Pomology S-1.** (Fruit Varieties.) I.

This introductory course of the work in fruit growing will consist of a thorough study of the principal varieties of the different fruits and the methods by which they are propagated.

One of the most prolific causes of failure in the fruit business is the growing of wrong varieties; varieties requiring a dry soil are set in a wet soil; tender varieties are set in a wet soil or where only hardy ones should be used; quality, productiveness, and season of ripening are ignored; and varieties are set which might be excellent in Ohio or Virginia or Missouri, but which cannot be grown profitably in Massachusetts.

This course aims to lay the foundation for a better state of things, and the student will be given a thorough drill on the leading varieties of the different fruits, and will have an opportunity to test personally many of the leading varieties, especially of apples.

In the work on propagation students are given a thorough training in both the theory and practice of the various methods in use. They are also required to do the actual work of making cuttings, grafting layers, etc.

5 class hours a week.

Credits, 5.

*Pomology Department.*

**Pomology S-2.** (Orchard Production.) II.

This course deals with questions concerning the establishing and maintaining of fruit plantations.

It will include a full discussion of the choice of a site for the plantation. Many an orchard has failed simply because it was put in the wrong place. On another site on the same farm it might have been a conspicuous success.

The soil preferences of varieties of fruits will be considered, so that the student may avoid setting Rhode Island greenings where



Baldwins should be grown, or Spies where Hubbardstons should stand.

The culture of fruit plantations will be considered, and the comparative value of sod and cultivation presented. Each system has its advantages and disadvantages. What are they, and under what conditions should each system be used?

Orchard implements will be discussed, examined, and tested, in order that the student may see for himself their good and bad points.

The question of cropping orchards will be discussed, — whether it is best to grow corn and beans and potatoes in the orchard, or to allow the trees to use all the land.

5 class hours a week.

Credits, 5.

*Pomology Department.*

### **Pomology S-3.** (Harvesting, Marketing.) I.

This course will deal with the picking, packing, storing, and marketing of fruits. More men fail on these points than anywhere else in the fruit-growing business. There is a vast difference between good and bad cultivation or fertilizing of fruit plantations, but there is still more between good and bad picking or packing. The student in this course will have actual practice, so far as is possible, in the harvesting of all the fruits available in the college plantations. He will put these same fruits in storage, and will later grade them and put them up for market. At the same time, he will receive lectures on all phases of the subjects under consideration.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Pomology Department.*

**Pomology S-4.** (Orchard and Vineyard Pruning.) II.

More fruit plantations are damaged by unintelligent pruning than by mismanagement in any other single operation. If the orchardist does not know that apple trees bear in spurs, he is very liable to cut these off in pruning, and so reduce his chances of a crop. If he is ignorant of the fact that the peach bears on last year's wood, he may remove most of this wood, and incidentally most of his crop. This course aims to give the student a thorough training in the theory of pruning and the methods of bearing of the different fruits.

At the same time, every student is required to do the work of pruning in the college orchards and vineyards until he becomes reasonably proficient with each kind of fruit.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Pomology Department.*

**Pomology S-5.** (Spraying.) III.

In this course a careful study is made of modern methods of spraying. All the principal spray materials are studied, and the student is given practice in their preparation for use and in applying them to the orchard.

The department is well equipped with modern spraying apparatus, from bucket pumps to large power outfits, and students are required to study the construction of these pumps, and to operate them in the orchards.

Spraying is very properly regarded as one of the most important operations in connection with growing fruit, and it is the aim of this course to train students to recognize the work of our common orchard pests, to prepare the proper materials for their control, and to apply these efficiently.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Pomology Department.*

**Pomology S-6.** (Orchard Management.) III.

The work in orchard management includes a detailed study of such questions as the planning and laying out of fruit plantations so that they may be handled most economically; the cost of various operations, and methods of reducing expenses; efficient handling of labor on fruit farms; the use of labor-saving devices in fruit work; the most economical units in fruit production.

While orcharding will always be the leading phase of the fruit business in Massachusetts, there are many unusual opportunities for success in growing the various small fruits. This course will deal with the problems of establishing and handling successfully plantations of strawberries, raspberries, blackberries, currants, gooseberries, and grapes, including such questions as the choice of varieties; the best types of soils; laying off and setting the plantation; the proper fertilizing; methods of pruning and training. The college has large plantations of most of these fruits, so that the student will have ample opportunity for all types of practical work. Everything possible will be done to make the course of the utmost practical value, as well as to give the scientific principles on which our practices are based.

5 class hours a week.

Credits, 5.

*Pomology Department.*

## COURSE IN FLORICULTURE

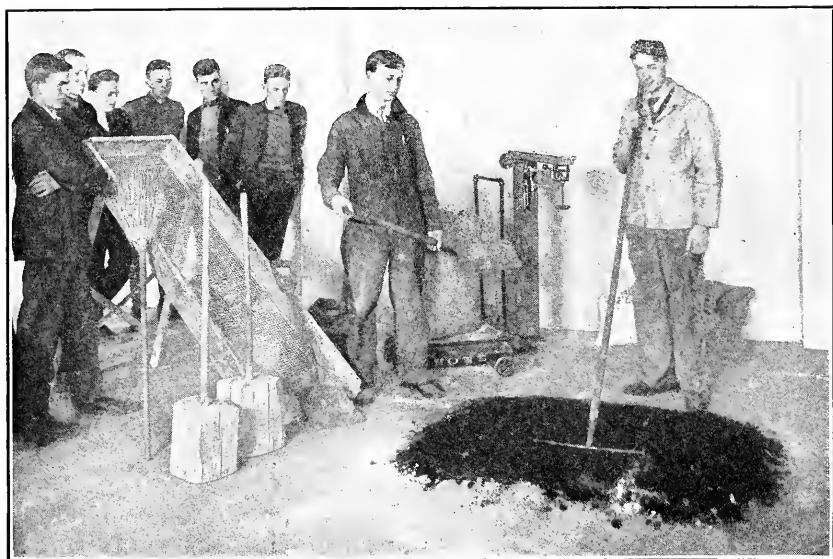
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Students who complete the course in floriculture are fitted primarily for work in commercial greenhouse establishments and retail flower stores. After gaining experience, such students may be able to start in business for themselves. Those who elect the courses in general horticulture, also, should be qualified for positions on private estates, in parks, or in nurseries.

The offices and classrooms of the Department of Floriculture are located in French Hall. Of the two lecture rooms, one will accommodate 40 students, the other 90 students; a laboratory, equipped with slate-covered tables, will accommodate 40 students. In the basement of the building the department has a specially prepared room for bulb storage, a fertilizer and tool room, and a large room for general storage purposes.

The glass area of the department consists of approximately 20,000 square feet, divided as follows: French Hall, range of 7,200 square feet, a durable practical commercial range, composed of palm and fern, violet, carnation, rose, and students' houses; the old Durfree range of 7,400 square feet, devoted to the growing of decorative, conservatory, and bedding plants and chrysanthemums; one house of 3,200 square feet, suitable for propagating work and general plant culture; and approximately 2,200 square feet in cold frames and hotbeds.

In addition, the department has 2 acres of land used for the summer culture of carnations, violets, gladioli, dahlias, sweet peas, bedding plants, etc. This includes a garden of about 4,700 square feet, devoted to the culture of annuals. A large collection of biennials and herbaceous perennials is maintained, and is being enlarged from year to year.



Fertilizer Mixing



Tractors at Work



## Course in Floriculture

### FIRST YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>
Floriculture S-1 (Garden Flowers and Bedding Plants) . . . . .	5	Floriculture S-2 (Greenhouse Construction, Heating, and Management) . . . . .	5	All students are required to take farm placement training for six months under the direction of the Supervisor of Farm Placement Training.
Pomology S-1 (Fruit Varieties) . . . . .	5	Horticulture S-1 (Plant Propagation) . . . . .	5	
Vegetable Gardening S-1 . . . . .	5	Rural Sociology S-1 (Social and Economic Problems) . . . . .	5	
Arithmetic S-1 <sup>1</sup> . . . . .	5	Rural Engineering S-3 (Carpentry) <sup>3</sup> . . . . .	2	
Agricultural Opportunities for Women S-1 <sup>2</sup> . . . . .	2	English S-1 <sup>4</sup> . . . . .	5	
	20		22	
	22			

### SECOND YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>	<i>Credits</i>
Floriculture S-3 (Commercial Floriculture) . . . . .	5	Floriculture S-4 (Commercial Floriculture) . . . . .	5	Floriculture S-5 (Conservatory Plants) . . . . .	5
Horticulture S-2 (Plant Materials) . . . . .	5	Agricultural Economics S-1 (Marketing) . . . . .	5	Forestry S-1 (Woodlot Management) . . . . .	5
Agronomy S-1 (Soils and Fertilizers) . . . . .	5	Rural Engineering S-2 (Farm Motors) <sup>5</sup> . . . . .	5	Electives . . . . .	10
Elective . . . . .	5	Elective . . . . .	5		20
	20		20		
<i>Electives</i>		<i>Electives</i>		<i>Electives</i>	
Pomology S-3 (Harvesting, Marketing) . . . . .	5	Horticulture S-3 (Plant Materials) . . . . .	5	Horticulture S-4 (Plant Materials) . . . . .	5
Horticulture S-5 (Construction and Maintenance) . . . . .	5	Horticulture S-6 (Construction and Maintenance) . . . . .	5	Horticulture S-7 (Construction and Maintenance) . . . . .	5
Home Economics S-3 (Clothing) . . . . .	5	Horticultural Manufactures S-1 . . . . .	5	Horticultural Manufactures S-2 . . . . .	5
		Home Economics S-5 (Home Nursing) . . . . .	5	Entomology S-1 (Beekeeping) . . . . .	5

<sup>1</sup> Students who are not required to take Arithmetic may elect either Rural Engineering S-1 or Home Economics S-1.

<sup>2</sup> This course is required of women students only.

<sup>3</sup> Students may elect Rural Engineering S-4 instead of Rural Engineering S-3.

<sup>4</sup> Students who are not required to take English may elect either Business Law S-1 or Home Economics S-2.

<sup>5</sup> Women students may elect Home Economics S-4 in place of Rural Engineering S-2.

**Floriculture S-1.** (Garden Flowers and Bedding Plants.) I.

This course is intended for students who will take up private estate work or who will specialize in floriculture. It will include a study of the annuals, biennials, herbaceous perennials, and bedding plants which are commonly used in commercial floriculture and in private estate work. Methods of propagation, culture, and uses will be considered. Laboratory exercises will include work in propagation, planting, study of materials, and planning of beds and borders.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Floriculture Department.*

**Floriculture S-2.** (Greenhouse Construction, Heating, and Management.) II.

This course will take up the origin, growth, and importance of the floriculture industry; development of the greenhouse; types of houses and construction; methods of greenhouse heating; general principles of greenhouse management, including soils and their preparation, fertilizers, watering, ventilation, and fumigation; methods of propagation for plants grown under glass. Textbook: White's "Principles of Floriculture."

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Floriculture Department.*

**Floriculture S-3.** (Commercial Floriculture.) I.

Courses S-3 and S-4 will be devoted primarily to a consideration of the important commercial crops. Special attention will be given to the culture (under glass) of roses, carnations, chrysanthemums, violets, and sweet peas. Other cut-flower crops and various potted plants will also be considered. Textbooks required during the two courses will be: Holmes, "Commercial Rose Culture;" Dick, "Commercial Carnation Culture" and "Sweet Peas for Profit;" Smith,



“Chrysanthemum Manual;” and Galloway, “Commercial Violet Culture.”

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Floriculture Department.*

**Floriculture S-4.** (Commercial Floriculture.) II.

A continuation of Floriculture S-3. In addition, a part of the course will be devoted to floral arrangement, including the general principles underlying the use of flowers in funeral designs and sprays, table decorations, corsages, vase, and basket arrangements.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Floriculture Department.*

**Floriculture S-5.** (Conservatory Plants.) III.

A study of the plants, both foliage and flowering, which are used in conservatories and in decorative work. Methods of propagation, culture, uses, and identification of plants will be included in the work.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Floriculture Department.*

**Floriculture S-6.** (Greenhouse Management.) III.

A course of general nature intended for those who have not taken the other courses in floriculture. Students who have taken the other courses will not be allowed to register in this course. It will include a brief description of greenhouse construction and heating; general principles of greenhouse management, including soils and their preparation, fertilizers, watering, ventilation, and fumigation; methods of propagation for plants grown under glass; outlines of cultural methods for important greenhouse crops. Textbook: White's "Principles of Floriculture."

3 class hours and 2 2-hour laboratory periods per week. Credits, 5.

*Floriculture Department.*

## COURSE IN VEGETABLE GARDENING

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This course is intended primarily to help fit men for the business of vegetable growing. A knowledge of vegetable gardening may also be a great help to men located near business centers and whose principal interest may be the dairy or orchard. Market gardening, combined as it often is with greenhouse vegetable forcing, is an interesting, all-season vocation that brings a young man into close contact with problems of soil management and the growing and marketing of a variety of crops. There are splendid opportunities in Massachusetts for young men who like this type of work. In it they will find full play for the best there is in them; and while earning a fair income in a healthful occupation, they will also find pleasure and satisfaction in the fact that they are producers of absolutely essential food products.

It is possible to begin the business of vegetable gardening in a moderate way (on rented land) with a limited outlay of capital, and the returns on the capital invested are quickly secured and usually quite satisfactory. Most students who specialize in the subject will no doubt wish to engage in business for themselves as soon as possible. For such as lack the necessary land and capital to begin operations at once, there are opportunities for work with established gardeners at wages dependent upon their ability. There are also opportunities for responsible positions for trained vegetable growers on private estates and with State institutions.

The equipment of the department is as follows: 10 acres of land devoted annually to the intensive production of all the vegetables commonly grown in Massachusetts; a large assortment of horse and hand garden tools; 500 linear feet of hotbeds and cold frames; 3,500 square feet of greenhouse space devoted to the production of early vegetable plants and the maturing of lettuce, tomatoes, and

## Course in Vegetable Gardening

### FIRST YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>
Vegetable Gardening S-1 . . . . .	5	Vegetable Gardening S-2 . . . . .	5	All students are required to take six months of farm placement training under the direction of the Supervisor of Farm Placement Training.
Pomology S-1 (Fruit Varieties) . . . . .	5	Horticulture S-1 (Plant Propagation) . . . . .	5	
Floriculture S-1 (Garden Flowers and Bedding Plants) . . . . .	5	Poultry S-1 or S-2 . . . . .	5	
Arithmetic S-1 <sup>1</sup> . . . . .	5	English S-1 <sup>3</sup> . . . . .	5	
	20		20	
Agricultural Opportunities for Women S-1 <sup>2</sup> . . . . .	2			
	22			

### SECOND YEAR

<i>Fall Term</i>	<i>Credits</i>	<i>Winter Term</i>	<i>Credits</i>	<i>Spring Term</i>	<i>Credits</i>
Vegetable Gardening S-3 . . . . .	5	Vegetable Gardening S-4 . . . . .	5	Vegetable Gardening S-5 . . . . .	5
Agronomy S-1 (Soils and Fertilizers) . . . . .	5	Rural Engineering S-2 (Farm Motors) <sup>4</sup> . . . . .	5	Rural Sociology S-1 (Social and Economic Problems) . . . . .	5
Electives . . . . .	10 or 11	Electives . . . . .	10 or 11	Rural Engineering S-3 (Carpentry) <sup>5</sup> . . . . .	2
	20 or 21		20 or 21	Electives . . . . .	10 or 11
<i>Electives</i>		<i>Electives</i>			22 or 23
Poultry S-3 . . . . .	6	Poultry S-4 . . . . .	6	<i>Electives</i>	
Pomology S-3 (Harvesting, Marketing) . . . . .	5	Pomology S-4 (Orchard and Vineyard Pruning) . . . . .	5	Poultry S-5 . . . . .	6
Horticultural Manufactures S-1 . . . . .	5	Horticultural Manufactures S-1 . . . . .	5	Pomology S-5 (Spraying) . . . . .	5
Dairying S-1 (Milk Testing) . . . . .	5	Forestry S-1 (Woodlot Management) . . . . .	5	Horticultural Manufactures S-2 . . . . .	5
				Entomology S-1 (Beekeeping) . . . . .	5
				Floriculture S-6 (Greenhouse Management) . . . . .	5

<sup>1</sup> Students who are not required to take Arithmetic may take either Rural Engineering S-1 or Home Economics S-1.

<sup>2</sup> This course is required of women students only.

<sup>3</sup> Students who are not required to take English may take either Business Law S-1 or Home Economics S-2.

<sup>4</sup> Women students may elect Home Economics S-3 in place of Rural Engineering S-2.

<sup>5</sup> Students may elect Rural Engineering S-4 in place of Rural Engineering S-3.

cucumbers. The classroom and laboratory of the department are located in French Hall. An excellent collection of books on vegetable gardening in all its phases is available in the college library.

### **Vegetable Gardening S-1. I.**

The work of this term is introductory in character. It will acquaint the student with the nature and extent of the business, sections where it is largely developed, and what it demands on the part of the grower. Ways and means of beginning the business, where to locate, the principles underlying tillage, and the maintenance of the fertility of the soil will be considered. Practical work will include the operations usually performed on market gardens at this season of the year. These will include: harvesting and storing crops for winter, seeding of cover crops, fall preparation of the land, construction of hotbeds and cold frames, etc.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

*Vegetable Gardening Department.*

### **Vegetable Gardening S-2. II.**

Attention will be given to the details involved in the production, selection, preservation, purchase, testing for germination and vitality, and the sowing of vegetable seeds. A study will be made of the details of growing early vegetable plants under glass. Practical work will consist of seeding and transplanting, making straw mats, glazing and painting sash, etc.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Vegetable Gardening Department.*

### **Vegetable Gardening S-3. I.**

A systematic study will be made in class and laboratory of the leading varieties of vegetables (some 250 or more being available in the variety garden), special emphasis being given to the determination of the best varieties and their adaptations. The exhibition

and judging of vegetables will be included. Practical exercises will also include fall work in the greenhouses.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

*Vegetable Gardening Department.*

#### **Vegetable Gardening S-4. II.**

The work of this term will include the detailed study of greenhouse crops and greenhouse management. The latter portion of the term will be devoted to the planning of the coming season's operations on a market-garden farm. Practical work will include soil sterilization, fumigation, watering, ventilating, and caring for the crops in the greenhouses, and a study of spray apparatus.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Vegetable Gardening Department.*

#### **Vegetable Gardening S-5. III.**

A continuation of the study begun in Course S-4 on the problems involved in the management of a market-garden business. Practical work will include spring preparation of the land, seeding, transplanting, cultivating, thinning, weeding, spraying, irrigating, etc. Organized trips will be made to market gardens in the Springfield and Boston districts.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

*Vegetable Gardening Department.*

## RELATED SUBJECTS IN OTHER DEPARTMENTS

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### **Agricultural Opportunities for Women. S-1. I.**

Agriculture is a field in which women are finding increasingly good opportunities.

The particular problems which the women engaged in farming will have to meet, and the special lines of farming in which they will have favorable opportunities, will be considered in a series of conferences.

2 class hours a week.

Credits, 2.

*Home Economics Department.*

### **Agronomy S-1. (Soils and Fertilizers.) I.**

This course will include, as far as possible, studies and discussions of the origin and formation of soils; classes and types of soils; the control of soil moisture; tillage operations; organic matter, its importance and maintenance; acid soils and liming. Considerable time will be devoted to actual work with fertilizing materials, and the student will be expected to become thoroughly familiar with farm manures, forms of agricultural lime, and commercial fertilizers, their composition, properties, care, and use.

1 class hour, 1 2-hour laboratory period, and 2 3-hour laboratory periods a week.

Credits, 5.

*Agronomy Department.*

### **Agronomy S-2. (Crops.) III.**

A course covering the rotation and structure of crops; their adaptation to soils and climate; varieties and the selection of seed; the preparation of the soil, fertilization, planting, cultivation, care,

harvesting, and use of field crops. Corn, oats, rye, barley, buckwheat, grasses, clovers, beans, peas, potatoes, and root crops will be studied. Actual practice with growing crops in the field and greenhouse, and with prepared specimens in the laboratory, including the judging of corn and potatoes, will be given.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

*Agronomy Department.*

### **Arithmetic S-1. I.**

This course presupposes the general knowledge of the four fundamental operations of arithmetic.

The scientific study of agricultural methods requires a considerable use of various arithmetical processes, and the work in this course will be carried on principally by the solution of practical problems relating to farm life, with the aim of preparing the student to handle more easily the work of his other courses. The main topics to be covered are percentage, ratio and proportion, areas and volumes of the commoner geometrical figures, solution of simple equations, and square root.

5 class hours a week.

Credits, 5.

### **Agricultural Economics S-1. (Marketing.) I, II, III.**

The purpose of this course is to present the business side or economics of agriculture. It is based upon the principle that products are made to sell, that the real object is to produce large money returns. The goal is the largest possible net profits with a given amount of land, labor, money, and equipment. The course deals with the possible types of profitable commercial agriculture in New England; the present location of the most profitable farming sections; the choice of a farm; the necessary investment, and the proportion to invest, in land, in improvements, in stock and equipment, and in reserves for labor and supplies on different kinds of farms.

Another section of the course treats of the principles of farm credit. Who should borrow, sources of credit, mortgage credit, farm loan associations, land banks, personal credit, national bank loans, credit unions, terms of credit, and how to use credit profitably are some of the topics studied.

Another division of the subject is marketing farm products. This will be treated in a very practical manner. The following are some of the topics: marketing as a part of production; outlets for the sale of farm products; principles of marketing; description of wholesale methods of distribution; middlemen, functions, and abuses; methods of sale, prices of farm products; price quotations; government aid in marketing; direct marketing; co-operative buying and selling; methods of successful co-operation; farmers' exchanges in Massachusetts; how to organize successfully.

Each student will be required to select some principal product in which he is interested, and make a careful study of its production, handling, and marketing on a profitable commercial scale. This course is given by the Department of Agricultural Economics. Lectures, textbook, original study, and report.

5 class hours a week.

Credits, 5.

*Department of Agricultural Economics.*

### **Business Law S-1. II.**

The work of this course will cover such points as land, titles, public roads, rights incident to ownership of live stock, contracts, commercial paper, and distinctions between personal and real property. Text, written exercises, lectures, and class discussions.

5 class hours a week.

Credits, 5.

### **English S-1. II.**

A fair command of written and spoken English is a very necessary part of the equipment of the practical farmer of to-day. The work in this course is arranged to give direct help to the student in prep-



aration for the other subjects he is carrying, and also aims to give him control of the ordinary business and social forms.

The course includes drill in the use of text and reference books, preparation of notes from readings and lectures, and a consideration of right and wrong methods of study. It also deals with composition, letter writing, business forms, and usages. Considerable practice will be given in the elements of public speaking, parliamentary law, and practice.

5 class hours a week.

Credits, 5.

### **Entomology S-1.** (Beekeeping.) III.

This course comprises a general consideration of the biology of the honey bee and the elements of practical beekeeping. Some topics covered are: life history, general behavior and instincts, structure, products, relations of bees to plants, the honey flora. The course aims particularly to afford first-hand practical experience with bees, to the end of enabling their proper maintenance for any purpose, — horticultural, educational, or apicultural. Bee diseases, a thorough understanding of which is fundamental, are emphasized. So far as possible, the work is made individual in constructing materials and apparatus and in the manipulation of bees.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Entomology Department.*

### **Farm Management S-1.** (Farm Management and Accounts.) II, III.

A study of farming as a business; the correlation and adaptation of different farm enterprises, as dairy, orchard, poultry, to the specific farm; land, labor, and capital requirements; farm and building, plans and arrangements; the choice and purchase of a farm. Several

laboratory periods will be devoted to practice in farm accounting. Farm experience is a prerequisite to this course.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Department of Farm Management.*

**Forestry S-1.** (Woodlot Management.) I, II, III.

A course in tending, harvesting, marketing, and renewing the forest crop, with particular reference to the problems of the farm woodlot. The instruction is mainly practical, and is conducted in the field, with a minimum of bookwork; but there is a constant emphasis upon the development of keen and imaginative observation, and the acquisition of the conservationist point of view. Opportunities for field work are varied and extensive. There are woodlots of several types on or near the campus, and students have the fullest use of the Mt. Toby Demonstration Forest, a 750-acre tract 7 miles distant, belonging to the college and managed by the Forestry Department.

2 class hour and 1 4-hour and 1 2-hour field periods a week. Credits, 5.

*Forestry Department.*

**Home Economics S-1.** (Business of the Household.) I.

There are many efficient methods successfully used in the business world which can be applied in the business of home-making.

Since the home-maker is largely responsible for all expenditures connected with the house, an important consideration in this course is the study of the family budget, the apportionment of the income, and the keeping of accounts.

Equally important is the standardization of household tasks, the study of systematic methods of work, selection and care of equipment, and the use of time and labor saving devices.

5 class hours a week.

Credits, 5.

*Home Economics Department.*

**Home Economics S-2.** (Foods.) II.

Every woman concerned with the welfare of the family is interested in the problem of nutrition. To select food wisely, and to prepare it so that the greatest amount of nutriment may be saved, is of the utmost importance.

Special study will be made of the needs of the body and the selection of foods to supply those needs; also care in the handling and keeping of foods, and planning meals for efficiency and economy.

Balanced menus are not vague and mysterious, but result from the application of a few fundamental principles. Many people are underfed, not from a lack of food, but from an unwise choice.

Consideration will be given also to such special problems as infant feeding and school lunches.

This course will include laboratory work of practical value.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

*Home Economics Department.*

**Home Economics S-3.** (Clothing.) I, II.

An important problem in the home to-day is the selection of suitable fabrics; therefore their character, cost, and durability are studied with reference to planning a wardrobe for a limited income.

Consideration will also be given to the principles of design, appropriateness, and simplicity in dress to develop good taste.

There will be practical work in sewing and making garments.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

*Home Economics Department.*

**Home Economics S-4.** (Clothing.) II.

A continuation of course S-3, which is a prerequisite for this course.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

*Home Economics Department.*

**Home Economics S-5.** (Home Nursing.) II.

It should be far easier to keep well than to become sick, provided one understands the fundamental principles of hygiene, thus insuring the care of the family health.

However, every home-maker needs some knowledge of home care of the sick, including the study of simple diseases and their prevention, the care of young children and invalids, and first aid to the injured.

5 class hours a week.

Credits, 5.

*Home Economics Department.*

**Horticultural Manufactures S-1.** I, II.

The utilization of culls and low grades of fruits and vegetables is becoming a more important problem each year. Producers should be able to market their whole crop at a profit. The general problems studied in this course will be: the manufacture of apple products from cull apples; the canning of all fruits and vegetables available at this season, together with the manufacture of their various products, such as jams, jellies, conserves, pickles, etc.

Students will be required to keep accurate costs of materials in all canning and manufacturing operations, together with a record of methods used.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

*Department of Horticultural Manufactures.*

**Horticultural Manufactures S-2.** III.

This is a continuation of Course S-1. The preservation of small fruits, together with the manufacture of their products, the evaporation of fruits and vegetables, the manufacture of maple products, and the canning of spring vegetables are the principal subjects studied. Prerequisite: Horticultural Manufactures S-1.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

*Department of Horticultural Manufactures.*

**Microbiology S-1.** (Hygiene and Sanitation.) I, II.

Deviation from health, from the normal being, is disease. The human body is susceptible to deviation from health. Certain elements are responsible for the entrance of disease into the body. The body becomes weakened through exposure, lack of exercise, unsuitable food, abuses. Under such circumstances it lays itself open to attack. There is the attack from within, which consists of some organic derangement, and the attack from without, which makes it possible for foreign enemies, agents, or micro-organisms to enter.

Closely associated with the production of disease are intermediaries and causal factors, as ventilation, water-supplies, sewage disposal, and food. They serve as vehicles for disease agents. The germs of disease find their way through them, and are carried by them. Besides, human contact seems to be the most important disseminator, and insects and animals may harbor or convey, and in some instances instigate, disease.

Then there are those conditions which react on the body in a physical manner and influence its mechanism and its operating facilities, as mental disturbances, character of food, conditions of living.

It is the purpose of this course to discuss the nature of diseases, what causes them, the significance of sanitation and hygiene in preventing them, and the methods of control; in other words, to study, in the light of present knowledge, how to preserve health and prevent deviation from health.

5 class hours a week.

Credits, 5.

*Microbiology Department.*

**Microbiology S-2.** (Dairy Bacteriology.) II.

Bacteria and other micro-organisms are the responsible agents for the changes which occur in milk and for the contagion which sometimes causes disease. They are found in milk at times when leaving the udder, they get in with the dust and dirt while milking,

and they adhere to the dairy utensils, which carry them over from one milking to the next. From the cow to the consumer there is the constant presence of these micro-organisms to contend with, on the one hand, and to foster, on the other. All steps taken are significant in their control. The milking process, the handling of the cow, the condition of the milker, the cleansing of utensils, the management of the stable, the feeding, straining, aëration, cooling, clarifying, pasteurizing, — all are steps in the control of micro-organisms.

Many kinds of changes take place in milk, due to different kinds of micro-organisms. Many of these changes are sought, as the ripening of cream for butter, of milk for cheese, of milk for milk drinks; and many of these changes, also, are fought against, as rropy milk, sour milk, bitter milk, tainted milk, etc.

Micro-organisms of typhoid fever, scarlet fever, diphtheria, and others not infrequently find their way through the milk to the consumer, and produce epidemic forms of these diseases.

It is evident, therefore, that to handle milk and milk products safely it is desirable to know something of the agents which are the source of so much attention in the dairy. This indicates the nature of the substance of this course. This course is required of all students who elect dairying as one of their special lines of work.

5 2-hour laboratory periods a week.

Credits, 5.

*Microbiology Department.*

### **Rural Engineering S-1. (Farm Engineering.) I.**

A general course giving instruction in the operation of the mechanical equipment used on the farm, and teaching that branch of engineering which pertains to farm improvements. The course covers the selection and use of field implements, lighting systems, water systems, and stationary gas engines. This work is taught by lectures and practical work with the equipment in the shop and in the field. Instruction is given in drainage and irrigation and in the

design of farm buildings. The farm building work is taught by lectures and by practical work in the preparation of plans for farm buildings.

2 class hours and 3 2-hour laboratory periods. Credits, 5.

*Department of Rural Engineering.*

### **Rural Engineering S-2.** (Farm Motors.) II.

This course deals with the gasoline engine as used for stationary work, automobiles, and tractors. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles, and tractors. Special attention is given to overhauling and repairing.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Department of Rural Engineering.*

### **Rural Engineering S-3.** (Carpentry.) I, II, III.

This course gives practice in the care and use of carpenters' tools through bench work, repair of farm equipment, and building construction. Small buildings are erected by the students to give practice in all the phases of house construction. Practice is given in the building of forms and in the mixing and placing of concrete.

2 2-hour laboratory periods a week. Credits, 2.

*Department of Rural Engineering.*

### **Rural Engineering S-4.** (Repair of Farm Equipment.) I, II, III.

The object of this course is to give practice in the handling of tools, which will help in the repair of farm machines and miscellaneous farm equipment. Practice is given in forging, including drawing and shaping iron and steel, welding and tempering edge tools, and general blacksmith's repairing. Exercises also include pipe fitting, soldering, splicing rope, belt lacing, and babbiting and

adjusting bearings. Practice is given in the use of machinist's tools, such as cold chisel, file, taps and dies, drill press, and lathe.

2 2-hour laboratory periods a week.

Credits, 2.

*Department of Rural Engineering.*

### **Rural Engineering S-5.** (Dairy Mechanics.) I.

This course is planned for men who are fitting themselves to take charge of dairy plants or allied lines of work. A study of steam boilers, steam engines, steam turbines, pumps, steam traps, line shafts, belting, electric motors, milking machines, and refrigeration plants.

3 class hours and 2 2-hour laboratory periods a week. Credits, 5.

*Department of Rural Engineering.*

### **Rural Engineering S-6.** (Orchard Machines and Structures.) I.

A general course giving instruction in the mechanical equipment used on the fruit farm. The course covers the selection and use of orchard implements; farm conveniences such as lighting systems, water systems, and sewage disposal systems; and gas engines as applied to spraying machinery. This work is taught by lectures and practical work on the equipment in the shop and in the field. Instruction is given in the planning of farm structures, with special emphasis on fruit storage.

2 class hours and 3 2-hour laboratory periods a week. Credits, 5.

*Department of Rural Engineering.*

### **Rural Sociology S-1.** (Social and Economic Problems.) I, II, III.

The purpose of this course is to acquaint the students with present-day problems of economics, sociology, and politics. The first part of the course will deal with general problems. During the second part a study will be made of the social, economic, and politi-



cal aspects of rural community life, readings, discussions, and written reports.

5 class hours a week.

Credits, 5.

*Department of Rural Sociology.*

**Veterinary Science S-1.** (Animal Diseases.) II, III.

This course acquaints the student with the more common diseases to which domesticated animals are susceptible. Particular attention is given to conditions favoring diseases, to communicable diseases, and to prophylactic measures, in order that the student may be able to reduce the prevalence of diseases among animals in his charge.

5 class hours a week.

Credits, 5.

*Department of Veterinary Science.*

## SHORT COURSES AT THE MASSACHUSETTS AGRICULTURAL COLLEGE

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This bulletin describes the work of the Two-Year Course, and a brief statement is made of the other short courses.

Short courses have been maintained by the Massachusetts Agricultural College for a number of years. They have made a universal appeal, proving attractive and valuable to experienced farmers and farm women, to college graduates who wished to know more about the science of agriculture, to young men and young women who expect to be engaged in farming, to teachers, club workers, and ministers. Short courses open the door of opportunity for busy men and women who wish to increase their efficiency and earning power. The aim of short course work is not to provide preparatory or elementary instruction, but to afford the largest amount of information and training in agricultural lines in the shortest possible time.

In this State there are thousands of young men and young women who are to become future farmers, orchardists, poultry producers, dairy men and women. It is to the interest of both the individual and the State that these young men and young women keep pace with the rapid development of agriculture. There are also many mature men and women, well past the usual school age, who desire to acquaint themselves with the more recent developments in agricultural science and practice. It is to meet these needs that short courses are offered.

Information in regard to any of the short courses may be obtained from the college. Short courses include, in addition to the Two-Year Course in Practical Agriculture, the One-Year Vocational Poultry Course, the Summer School, the Winter School, and Unit Courses. A description of these courses is given in the following pages.

## A ONE-YEAR VOCATIONAL COURSE IN POULTRY HUSBANDRY

---

J. C. GRAHAM, LUTHER BANTA, W. E. RYAN, W. A. SANCTUARY, *Staff*.

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This course is designed for graduates of the agricultural vocational schools and others who wish to take a truly vocational course and can spend one year only at college. This course begins with the winter term in January, and extends through the college year. It is limited to 15 students.

The institution of this One-Year Vocational Course in Poultry Husbandry is to meet the needs of those who wish to specialize in this branch of agriculture and who feel they cannot spend either two or four years in doing it. The course is intermediate between the college course and the ten weeks' short course, and is designed to prepare the student for practical poultry keeping, either for pleasure or for profit. "Learn to do by doing" is our motto. A more or less detailed outline is given below, and the general plan is as follows: the students begin with Course 1, Elementary Poultry Keeping, and elect about 15 credits from other subjects listed in Course 6. From the close of the Winter Short Course, about March 10, until college closes the latter part of June they devote all of their time to poultry work. During the summer vacation students have an opportunity to secure additional practical experience on general or specialized farms. With the opening of college in the fall, students again devote all of their time to poultry work, finishing the course at the end of the fall term, the latter part of December. As the busy season with poultrymen begins soon after the first of the year, the students, by finishing the course before the holiday season, are ready to accept attractive positions or enter business for themselves.

### Course of Study

**Course 1. Elementary Poultry Keeping.** A textbook course supplemented with lectures, recitations, etc., covering the entire field of elementary poultry keeping, special emphasis being laid upon the following subjects: opportunities in poultry keeping, poultry house construction, feeds and feeding, breeds and breeding, incubation, brooding, growing stock, marketing, and poultry diseases. Five recitations per week throughout the year.

**Course 2.** A practical laboratory course covering the following subjects: carpentry, fattening, killing, picking, dressing, caponizing, avian anatomy and physiology, making and applying disinfectants and lice powder, also identification and study of poultry feeds, etc. Two laboratory periods per week from October until December, inclusive.

**Course 3. Poultry Judging.** Fall term. A study of the "Standard" and economic classification of poultry, including score card and comparative judging of exhibition and utility poultry for egg and meat characters. Selecting hens for high and low production (or culling) will receive special emphasis in this course. "The American Standard of Perfection" will be used for a text. Two two-hour laboratory periods per week.

**Course 4.** A practical laboratory course in incubation, brooding, and growing stock. Students receive practice in operating small and mammoth incubators as well as kerosene and coal stove brooders. Some time is devoted to natural incubation and brooding. Equivalent to five laboratory periods per week from March to June, inclusive.

**Course 5.** A conference, observation, and general reading course, equivalent to one or two recitations per week during the spring and fall terms. In this course the student will become thoroughly acquainted with the best literature on poultry subjects through books, station bulletins, scientific articles, poultry magazines, etc. A thorough discussion of the problems met by the practical poultryman is a strong feature of this course.

**Course 6. Supplementary Courses.** Each student shall select from the winter short course enough of the following subjects to give him at least 12 to 18 credit hours: pomology, soils, agronomy, rural engineering, beekeeping, market gardening, animal husbandry, farm management, dairying, etc.

**Course 7. Poultry Management.** A general poultry practice course in the care and management of poultry, the work to be done morning, noon, and night, and other periods as necessity requires, the class to be responsible for the work in caring for specified flocks, under the supervision of instructors, from March until college closes, and from October until December, inclusive. Equivalent to six two-hour periods per week.

### **Entrance Requirements**

Applicants must be at least eighteen years of age and have a good elementary education.

### **Fees**

There is no tuition for residents of Massachusetts, but a laboratory fee of \$5 is required for the fall term and the same for the spring term.

For further information concerning this course, write Poultry Department.

## THE SUMMER SCHOOL

---

The Four Weeks Summer School for 1921 was under the joint direction of the college and the Division of Elementary and Normal Schools. The following courses were offered: —

### **Rural Social Service**

- Rural Organization
- Problems of Government
- Elements of Rural Sociology
- Marketing Agricultural Products
- Eugenics
- Rural Survey
- Rural Leadership
- Organized Play
- Dramatic Presentation
- Design and Practical Arts

### **Agriculture, Horticulture, and Home Economics**

- Agricultural Opportunities for Women
- Soil Fertility
- Manures and Fertilizers
- Types and Breeds
- Feed and Management
- Dairying
- Farm Management
- Farm Accounts
- Poultry
- Farm Machinery and Gas Engines
- Fruit Growing
- Flower Growing
- Vegetable Gardening
- Food Preservation
- Foods and Nutrition
- Foods
- Elementary Dietetics
- Clothing Efficiency

### **Agriculture, etc. — Con.**

- Business of the Household
- Native Ferns
- Plant Life
- Plant Diseases
- Dress Design

### **Education**

- Methods in English for the Intermediate and Grammar Grades
- Methods in Elementary Schools
- Methods of Teaching History in Grammar Grades
- Training in the Duties of Citizenship
- Primary Language
- Primary Reading
- Geography
- Arithmetic
- Teaching of Mathematics in Secondary Schools
- French
- Spanish
- Hygiene and Sanitation
- Trees and Shrubs

### **Vocational Agricultural Teaching**

- Principles and Methods of Teaching
- Special Methods in Vocational Agricultural Teaching
- Professional Improvement Problems
- Supervision and Administration of Agricultural Education
- Vocational Education

In addition to the Four Weeks Summer School a conference on social work was held from July 5 to July 16, especially adapted to the needs of community, Red Cross, and Y. M. C. A. workers. A school of Rural Home Life was held from July 18 to July 25, offering the following courses: —

Family at its Best	Vegetable Gardening
Recreation	Poultry
Flowers, Trees, Shrubs	Home Problems
Food Preservation	Home Furnishing
Clothing	

The Two-Year Course was continued for a nine-week term during the summer, from June 27 to August 27.

## THE WINTER SCHOOL

---

The Winter School has been established for a number of years at the college, and has proved to be very popular with farmers, their wives, sons, and daughters, teachers, college graduates, and others. This school begins January 2. It offered last year instruction in the following: —

**Group A. General Agriculture**

- Soil Fertility
- Field Crops
- Types and Breeds of Live Stock
- Live Stock Feeding
- Animal Breeding
- Dairying
- Dairy Bacteriology
- Animal Diseases
- Poultry Husbandry

**Group B. Horticulture**

- Fruit Growing
- Market Gardening
- Floriculture
- Horticultural Manufactures

**Group C. Farm Business**

- Farm Management
- Farm Accounts

**Group D. Related Subjects**

- Botany
- Entomology
- Farm Structures
- Farm Machinery
- Agricultural Opportunities

**Group E. Home Making**

- Foods
- Clothing
- The Business of the Household

**Group F. Vocational Agricultural Teaching**



## UNIT COURSES

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A student enters the agricultural Unit Courses if his previous education is not sufficient to permit of his taking up the work of the Two-Year Course. The agricultural Unit Courses begin every month in the year except September. Each man may select, in addition to the English and mathematics that are required, two or three lines of work to which he will expect to devote most of his time.

In connection with the Unit Courses there is much actual practice on the farms, orchards, gardens, in the dairies, barns, shops, and greenhouses, and with poultry, live stock, and farm machinery. These courses are limited to students sent by the Federal Board for Vocational Education.

### July

Separators and Separating  
 Bush Fruit  
 Grasses  
 Cultural Details of Hardy Crops  
 English  
 Arithmetic  
 Gas Engines

### August

Cream Ripening and Butter Making  
 Packing and Storing  
 Cash Crops  
 Study of Insects and Diseases and  
   their Control  
 English  
 Arithmetic  
 Gas Engines

### October

Ice-cream Making  
 Varieties of Fruit other than Apple  
 Soil Classification  
 Study of Harvesting, Marketing  
   and Storing Vegetables  
 English  
 Arithmetic  
 Gas Engines

### November

Soft Cheese Making  
 Varieties of Apple  
 Soil Management — Moisture, Con-  
   trol, Tillage  
 Manures, Cover Crops, Fertilizers,  
   Crop Rotation, etc.  
 English  
 Arithmetic  
 Gas Engines

**December**

Dairy Bacteriology  
 Packing and Marketing of Fruits  
 Soil Management — Organic Matter, Liming  
 Study of the Character of the Vegetable Gardening Business  
 English  
 Arithmetic  
 Gas Engines

**January**

Dairy Cattle, Breeds  
 Establishing the Orchard  
 Fertilization Theories  
 Vegetable Forcing  
 English  
 Arithmetic  
 Gas Engines

**February**

Breeding and Management  
 Cultivation and Fertilizing  
 Fertilizer Materials  
 Cultural Details of Principal Forcing Crops  
 English  
 Arithmetic  
 Gas Engines

**March**

Dairy Feeding  
 Pruning Tree Fruits  
 Fertilizer Practices  
 Elementary Study of the Seed, the Plant; growing Early Vegetable Plants  
 English  
 Arithmetic  
 Gas Engines

**April**

Composition and Secretion of Milk  
 Pruning Grapes and Bush Fruits  
 Cropping Systems  
 Study of the Soil; Planning the Home Garden  
 English  
 Arithmetic  
 Gas Engines

**May**

Testing of Milk  
 Spraying  
 Cereal Crops  
 Cultural Details of Hardy Crops  
 English  
 Arithmetic  
 Gas Engines

**June**

Market Milk (Handling)  
 Strawberries  
 Legumes  
 Cultural Details of Tender Crops  
 English  
 Arithmetic  
 Gas Engines

## DIRECTORY OF INFORMATION

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### A. The College

Those desiring college catalogues, the President's annual report, and other pamphlets giving full information relative to entrance requirements, courses of study, expenses, opportunities for student labor, and so forth, should address Ralph J. Watts, Secretary, Amherst, Mass.

All questions regarding admission to the college, either to the freshman class or to advanced standing, should be addressed to Prof. P. B. Hasbrouck, Registrar, Amherst, Mass.

### B. Experiment Station

The Experiment Station conducts investigations in as many lines of agricultural science and practice as its funds will permit. It has charge of the inspection of commercial fertilizers, commercial feeding stuffs, and milk-testing apparatus. Branch stations in cranberry and market-garden culture are maintained in other sections of the State.

The station considers the farmers' problems to be its problems, and desires to keep in touch with them.

Requests for bulletins reporting the results of experiments and inspections, and for other information on the work of the station, should be addressed to Sidney B. Haskell, Director of the Experiment Station, Amherst, Mass.

### C. The Graduate School

Questions relating to courses offered leading to the degrees of Master of Science and Doctor of Philosophy, admission and work required, should be addressed to Dr. Charles E. Marshall, Director of the Graduate School, Amherst, Mass.

### D. The Extension Service

Inquiries of a general nature regarding the work of the Extension Service, extension publications, or requests for new lines of work should be addressed to John D. Willard, Director of Extension Service, Amherst, Mass.

### E. Short Courses

For information concerning the Short Courses, the Two-Year Course in Practical Agriculture, the Ten-Weeks Winter School, the Summer Schools, write or apply to John Phelan, Director of Short Courses, Amherst, Mass.

## SHORT COURSE ENROLLMENT

### Two-Year Course, 1920-21

#### Second Year

Name	Address
Allen, Chester C., Amherst	
Almy, Roger W., New Bedford	
Amsden, Maude E., Petersham	
Baird, Francis W., Somerville	
Barney, Ernest W., Corinna, Me.	
Baxter, Samuel B., Tenaflly, N. J.	
Bemis, Raymond B., Spencer	
Bennett, William W., Arlington	
Boland, Albert M., Worcester	
Breen, Arthur J., Granby	
Bronsdon, William A., Baldwinville	
Brooker, John P., Roxbury	
Bruce, Mary E., Boston	
Bryant, Frank K., Lowell	
Burke, Leslie J., Medford	
Burnett, Marston, Lexington	
Burnham, Theodore I., Essex	
Cady, Howard M., South Shaftsbury, Vt.	
Camp, Emily B., Norwich, Conn.	
Carpenter, Ruth, Hudson	
Carroll, Margaret A., Boston	
Christensen, Frank W., North Easton	
Clark, Chester F., Fitchburg	
Coles, Howard F., Tarrytown, N. Y.	
Colton, Hartman D., Springfield	
Converse, John K., Andover	
Corey, Raymond S., Amherst	
Crocker, Fred C., Amherst	
Crosby, Leon R., Tyngsborough	
Crowell, Homer M., Nutley, N. J.	
Daisy, Walter E., Roslindale	
Dill, Clarence E., Raynham Center	
Doane, Robert A., North Brookfield	
Dole, Stevens F., Shelburne	
Du Fresne, Francis A., Lenox	
Dunbar, Charles B., Taunton	
Dunleavy, Henry J., Boston	
Estey, Roger B., Somerville	
Fay, Ula F., East Orange	
Gallant, Daniel J., Gloucester	
Gaudette, Claude S., Boston	
Gifford, Franklin M., Middleborough	

Name	Address
Girard, Albert J., East Brimfield	
Graumann, Lewis M., Roxbury	
Griffin, Artemas G., Westford	
Hall, Helen, Milton	
Hamilton, Grant E., Rowe	
Hamilton, Weston A., Salem	
Hancock, Russell H., Vineyard Haven	
Hartling, Wilfred L., Boston	
Hartwell, Robert M., Buckland	
Haskell, Wilder A., South Hadley Falls	
Hayden, Arthur L., Natick	
Heinlein, Edward B., Dover	
Hoyt, Perley L., Perkinsville, Vt.	
Huckins, Norman C., Dorchester	
Huntley, Robert E., West Somerville	
Igo, Bernard J., West Somerville	
Jacques, John W., Malden	
Jauncey, Oakleigh W., Williamstown	
Jordan, Emmett P., West Medford	
Judge, Clarence P., Raynham	
Kallio, Tovia M., Middlefield	
Kimball, Howard A., Littleton	
Knight, Henry E., Amherst	
Lawrence, Harold T., Auburndale	
Lawton, Edgar L., Brattleboro, Vt.	
Libby, Ben F., Springfield	
Libby, Carl E., Springfield	
Lincoln, Leon P., Barre	
Lord, George W., Framingham	
Lounsbury, Francis E., Cambridge	
MacLeod, Norman F., Lynn	
Macomber, Donald A., Springfield	
Magoon, Austin W., Greensborobend, Vt.	
McFarlan, John W., Cincinnati, Ohio	
Miller, Fred R., Bernardston	
Morse, Harold S., Arlington	
Morse, Herbert E., Foxborough	
Mullen, Frank M., Fayville	
Mumford, William H., Springfield	
Narkin, Isadore, Brockton	
Newell, Joseph D., Brooklyn, N. Y.	
Norrington, Henry, Amherst	

Name	Address
Nowers, Rodman C.,	Danvers
Oakes, John J.,	Wellesley
O'Brien, Katherine F.,	Lawrence
Olson, Nils T.,	Dorchester
O'Neal, Fred,	Yakima, Wash.
Owens, Zorayda K.,	Haverhill
Pagliaro, Frank M.,	Springfield
Pellis, Abraham,	Chelsea
Pickard, Herbert P.,	Concord Junction
Priest, Atwood W.,	North Vassalboro, Me.
Purdy, Donald R.,	Waverley
Quinn, William R.,	Natick
Quirk, William J.,	Waltham
Raymond, Matthew G.,	Amherst
Richards, Osgood S.,	Amherst
Robinson, Frederick C.,	Westford
Rodway, George W.,	Amherst
Root, Howard C.,	Colrain
Russell, Paul B.,	West Medway
Sanctuary, Alfred E.,	Amherst
Sawyer, John H.,	North Brookfield
Sexton, John W.,	South Boston
Shaw, Charles D.,	Westfield
Shaw, Walter B.,	Sutton
Smith, Raymond L.,	East Hartford, Conn.
Smith, Sidney A.,	Worcester
Snelling, Samuel W.,	Lincoln

Name	Address
Spinney, Joseph W.,	Manchester
Spooner, Roy A.,	Dorchester
Spooner, William D.,	Brimfield
Spring, Earle N.,	Millers Falls
Steele, Gordon E.,	Waverley
Steele, Percy H.,	Hopkinton
Talbot, William J.,	Amherst
Taylor, Arthur R.,	Framingham
Thorne, Henry H.,	Deerfield
Tipple, Albert N.,	Amherst
Trafton, Walter R.,	Swampscott
Vartanian, Neshan,	Indian Orchard
Veselak, Helen C.,	Westfield
Walsh, John, Jr.,	Bedford
Warner, Harry F.,	Wollaston
Waterman, Harry L.,	South Thomaston, Me.
Watson, Alan A.,	Providence, R. I.
Whitcomb, Harold A.,	Concord Junction
White, Alice L.,	Bristol, Conn.
White, Ralph H.,	Barnard, Vt.
Whitmore, Raymond S.,	Arlington Heights
Wiggin, H. Theron,	Norwood
Willson, Stewart H.,	Thompsonville, Conn.
Wilson, Harvey W.,	Boston
Wood, Matthew A.,	South Portland, Me.
Young, George A.,	Wilkinsonville

### First Year

Adair, Eldred, Boston  
 Adams, John, Cambridge  
 Ahlstrom, Roger W., East Milton  
 Allen, Sidney H., Amherst  
 Arp, Richard D., Amherst  
 Axtman, John L., Chestnut Hill  
 Bard, John, Amherst  
 Belcher, Edgar E., East Weymouth  
 Bell, William T. A., Dorchester  
 Benson, John M., Mt. Desert, Me.  
 Betterley, Guy W., Brattleboro, Vt.  
 Bligh, Norman F., Boston  
 Blish, Stanley F., Brookline  
 Bosworth, Earl K., North Orange  
 Breivogel, Henry A., Jamaica Plain  
 Bresnahan, John F., Malden  
 Brown, Frederick D., Webster  
 Brown, Milton S., Templeton  
 Burke, James A., Dorchester  
 Bushey, William F., Amherst  
 Cahill, Paul B., Waltham  
 Campbell, Lewis H., Leominster  
 Carlsen, Lewis, Gloucester  
 Carroll, Charles R., Amherst

Castillo, Aristides H., El Savador, C. A.  
 Castillo, Joseph A., El Savador, C. A.  
 Chamberlain, Bert N., Hudson  
 Clark, William G., Amherst  
 Clifford, Laura M., Boston  
 Cluff, Victor N., Dracont  
 Condon, Thomas C., Medford  
 Considine, Francis, Somerville  
 Convery, Edward F., Charlestown  
 Cook, Ralph W., Franklin  
 Crossman, Laurence S., Springfield  
 Crowell, Elbridge H., Wollaston  
 Cushman, John K., Springfield  
 Davenport, Aris E., Dorchester  
 David, James V., Amherst  
 De Lano, Wilbert K., Richmond Hill, N. Y.  
 Diebner, Louis T., Gloucester  
 Doane, Smith E., Worcester  
 Donnellan, Arthur L., Cobalt, Conn.  
 Donovan, Albert P., Canada  
 Dunbar, Albert J., Saugus  
 Dupre, Norman C., Grafton  
 Dow, Don C., Keene, N. H.  
 Downey, Francis W., Boston

Name	Address
Erickson, Karl H.,	Somerville
Etzel, George F.,	Portland, Me.
Farndon, Charles H.,	Worcester
Farrow, Henry G.,	Rockport, Me.
Fazio, Charles F.,	Springfield
Finnegan, Andrew F.,	Lowell
Fitzgerald, Edward J.,	Fitchburg
Flagg, Nolan R.,	Worcester
Flaherty, Martin,	Wamesit
Fletcher, Robert L.,	Stow
Galbraith, Hermon W.,	South Hadley
Galvin, Daniel J.,	South Boston
Gamage, John C.,	Portland, Me.
Gauthier, Francis J.,	Boston
Gavett, George B.,	South Portland, Me.
Geremonty, Francis H.,	Stoneham
Gokey, Emery,	Rutland, Vt.
Grant, Nelson A.,	Indian Orchard
Green, George A.,	Cambridge
Griffin, Charles M., Jr.,	Westford
Grimes, George R.,	Nantucket
Gustafson, Gustaf A.,	Wilmington
Hagan, Patrick,	Cambridge
Haley, William H.,	Malden
Hannigan, William E.,	Milton
Harrington, Walter P.,	North Amherst
Harrington, William J.,	Rutland, Vt.
Harrison, Nicholas P.,	London, England
Hartwell, John R.,	Lincoln
Hasbrook, Stephen L., Jr.,	Amherst
Hasbrouck, Ethel E.,	Amherst
Haskins, Gerald E.,	Amherst
Headberg, Axel E.,	West Somerville
Heald, Edwin T.,	Ashburnham
Hibbard, Perley,	Dedham
Hopkinson, Harry B.,	Brattleboro, Vt.
Humphrey, Lawrence E.,	Wareham
Hurd, Merton B.,	Spencer
Jacomb, Constance L.,	Groton
Jaeckle, Matthew L.,	Nantucket
Joe, James B.,	East Milton
Johnson, Carl S.,	Gloucester
Jordan, Llewellyn P.,	Bar Harbor, Me.
Josey, Benjamin F.,	Granby
Kavanaugh, John F.,	Waltham
Keating, Joseph M.,	Willimansett
Keirstead, Ralph R.,	Worcester
Keith, George R.,	West Boylston
Kemble, Winslow,	Marblehead
Kesseli, Howard M.,	Worcester
Kinder, Lawrence P.,	Saxonville
Knight, Allen, Jr.,	Amherst
Knightly, George T.,	Amherst
Knowles, Frank P.,	Dorchester

Name	Address
Kohlrausch, George E.,	Chelsea
Kruk, John A.,	South Deerfield
Labrovitz, Max B.,	Amherst
Leavitt, Dorothy W.,	Whitman
Le Ballister, Ralph H.,	Concord
Le Garde, Aldor L.,	Boston
Leonard, John F.,	Amherst
Les Carbeau, Arthur M.,	Providence, R. I.
Lincoln, Edward J.,	Spencer
Lolley, Horace J.,	Pelham
Loring, Frank S.,	Gloucester
Mack, Harvey C. S.,	Gloucester
MacKnight, Harry M.,	Orange
Maggi, Joseph F.,	Holyoke
Manchester, Philip,	Fall River
Mans, Charles W.,	South Royalton, Vt.
Manson, Alexander,	Roxbury
Margreve, Frederick,	Cambridge
Markham, Albert G.,	Springfield
Marshall, Frederick W.,	Milton
Martin, Charles J.,	Worcester
Mason, Edwin C.,	Charlestown
McKenna, George E.,	Orange
McKenna, Phillip J.,	Hyde Park
McLaughlin, George B.,	Amherst
McLeod, Herbert H.,	North Amherst
Mills, Francis,	New York, N. Y.
Moore, Lloyd W.,	Worcester
Motyka, John J.,	Amherst
Nettleton, Francis S., Jr.,	Shelton, Conn.
Norton, Frances C.,	Salisbury, Conn.
Packard, Edward A.,	Dorchester
Packard, Marjory E.,	Ashfield
Palmer, Justin,	Lowell
Parsons, Howard J.,	Conway
Partenoff, Christo,	Middleborough
Paquett, Arthur L.,	Malden
Perry, Gardner,	Dedham
Pollock, Gordon S.,	Salem
Powell, Katharine L.,	Boston
Power, Maurice J.,	Amherst
Prescott, William H.,	Holyoke
Preston, John D. S.,	Wytheville, Va.
Ramsdell, Kenneth H.,	Southville
Rand, Arden W.,	Amherst
Ravinski, Albert J.,	Newton Upper Falls
Rhodes, Paul G.,	Lynn
Rhodes, Charles E.,	Amherst
Richards, Isaac,	Long Beach, Calif.
Riley, William C.,	Coventry, R. I.
Ripley, David H.,	Blandford
Ritchie, Harry E.,	Rutland, Vt.
Robinson, George S.,	Lynn
Robinson, Leo V.,	Athol

Name	Address
Ross, Ian H.,	New York, N. Y.
Roy, Leon,	Lawrence
Russell, Byron R.,	Brimfield
Russell, Elizabeth,	Boston
Sanford, Paul R.,	Stamford, Vt.
Sargent, Edna M.,	Chelmsford
Savcheff, Andrew,	Springfield
Sayles, Arthur U.,	Providence, R. I.
Schlitz, Henry,	Northampton
Seaver, Harold D.,	Agawam
Sherwood, Joseph M.,	Huntington
Slate, Herbert T.,	Westborough
Sprague, Morrill G.,	Harvard
Standley, Wallace,	Middleton
Steel, Percy P.,	Hopkinton
Stevenson, John,	Worcester
Stuart, Frances E.,	Bangor, Me.
Sullivan, Joseph S.,	Holyoke
Sullivan, Patrick W.,	Amherst
Sutton, Samuel C.,	Needham
Thompson, Burton E.,	West Somerville

Name	Address
Thouin, Faina G.,	Easthampton
Tompkin, Harry W.,	Newton Upper Falls
Tyzzer, Gerald E.,	Wakefield
Unwin, Edwin,	Amherst
Vaber, John E.,	Lee
Wadman, Loran W.,	Medford
Walsh, William,	Jamaica Plain
Watson, Grant M.,	Lowell
Wells, Alphonsus,	Malden
Wheeler, John W.,	Cooperstown, N. Y.
Whidden, Ralph E.,	York, Me.
White, Donald M.,	Winthrop
Wholly, Roger T.,	Cambridge
Willet, Frederick W.,	Lowell
Williams, Archie,	Westfield
Wilson, Frank E.,	Warren
Wilson, Harold E.,	Graniteville, Vt.
Woodworth, Ralph M.,	Rowley
Worthley, James E.,	Wakefield
Wyman, Francis,	Medford

### Summary of Short Course Enrollment

	Men.	Women.	Total.
Two-Year Course, second year, . . . . .	126	11	137
Two-Year Course, first year, . . . . .	185	12	197
Vocational Poultry Course, . . . . .	19	—	19
Winter School, 1920, . . . . .	90	22	112
Summer Sessions, 1920: —			
Four and Six Weeks' School, . . . . .	36	150	186
Eight Weeks' School for Two-Year Students, . . . . .	71	—	71
Eight Weeks' School for Unit-course Students, . . . . .	65	—	65
Unit Courses, September, 1920, . . . . .	50	—	50
Unit Courses, prior to September, 1920, . . . . .	24	—	24
Totals, . . . . .	666	195	861
Counted twice, . . . . .	100	—	100
Totals, . . . . .	556	195	761





**APPLICATION FOR ENROLLMENT**  
**IN THE**  
**TWO-YEAR COURSE IN PRACTICAL AGRICULTURE**  
**OFFERED BY THE**  
**MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST**

---

Name\_\_\_\_\_

Date of Application\_\_\_\_\_

Post Office\_\_\_\_\_Street\_\_\_\_\_State\_\_\_\_\_

Present Occupation\_\_\_\_\_

Previous Education\_\_\_\_\_

Finished Elementary Schools at\_\_\_\_\_

High School: Number of Years\_\_\_\_\_Where\_\_\_\_\_

College\_\_\_\_\_Where\_\_\_\_\_

Farm Experience: Number of Years\_\_\_\_\_Type of Farm\_\_\_\_\_

Reference\_\_\_\_\_

Name

Address

Name and address of person to notify in case of illness or accident:\_\_\_\_\_

-----  
Mail this blank to John Phelan, Director of Short Courses, Massachusetts Agricultural College.



## MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST

PRESIDENT'S OFFICE.

The Massachusetts Agricultural College charges a yearly tuition fee of \$120 to foreigners and of \$60 to others who are not residents of Massachusetts. In order to satisfy the college authorities that an applicant is entitled to free tuition they require a statement, signed by the clerk of the city or town in which the applicant resides, certifying to the fact that the father of the applicant is a legal resident of said city or town. Such a statement may be made on the form below. If this is not presented when the student registers, the Treasurer has no option but to collect tuition on the basis of \$120 per year.

KENYON L. BUTTERFIELD.

DEC. 20, 1919.

. . . . .  
*To the President of the Massachusetts Agricultural College.*

This is to certify that on the date specified below, the father of

-----  
is a legal resident of \_\_\_\_\_

City

State

Signed \_\_\_\_\_

Town or city clerk

Date \_\_\_\_\_

(Seal)

Mail this blank with your application blank to

JOHN PHELAN, *Director of Short Courses*  
MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST, MASS.

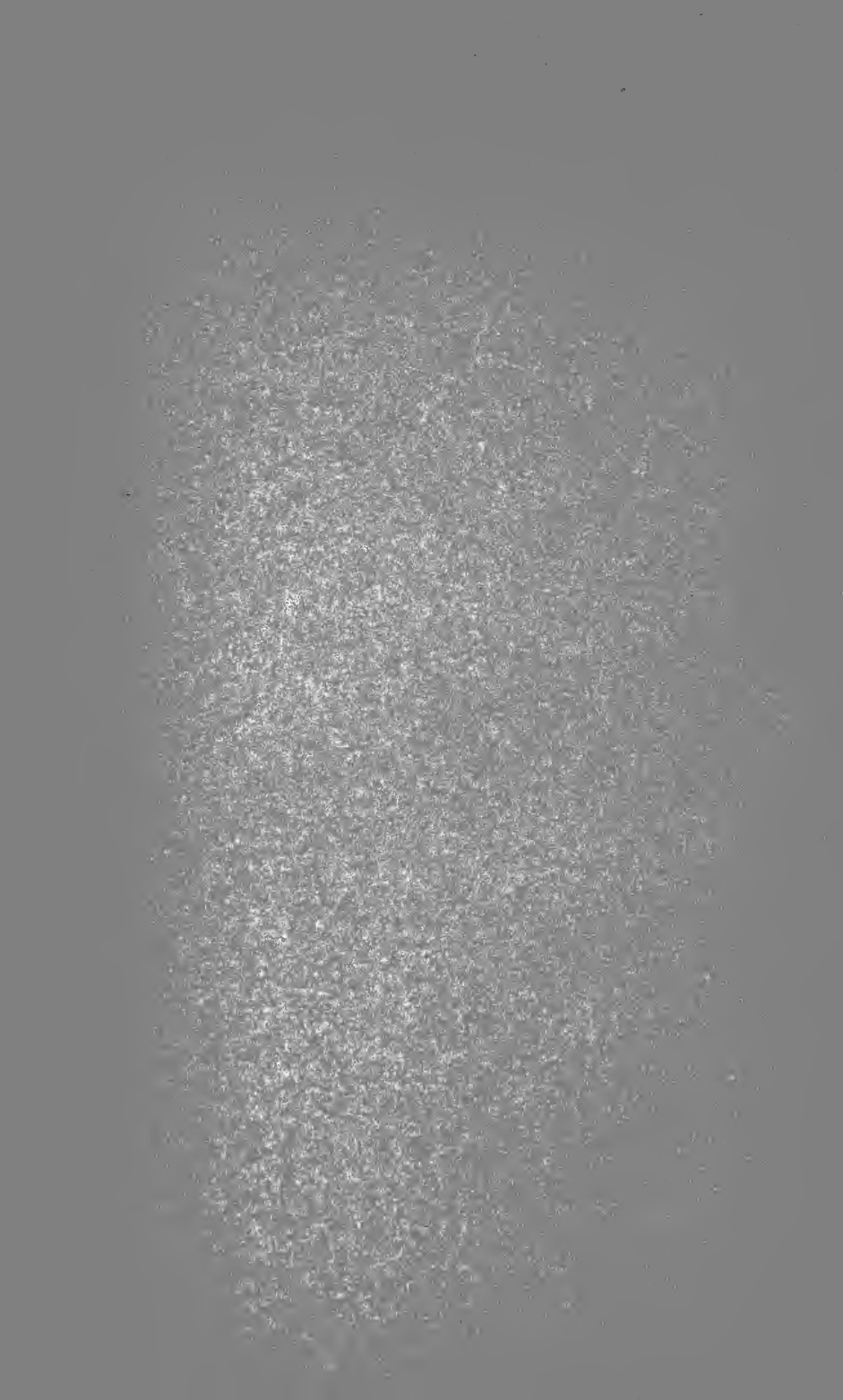


MASSACHUSETTS  
AGRICULTURAL COLLEGE

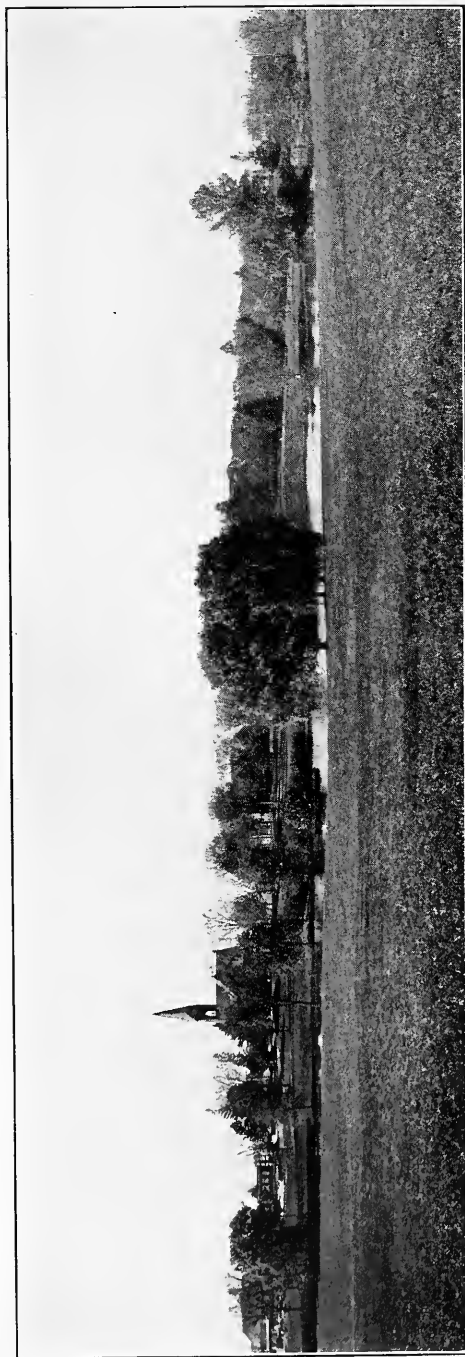
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THE TEN WEEKS' WINTER SCHOOL  
1922









A view of the campus



# THE M. A. C. BULLETIN

Amherst, Massachusetts

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Volume XIII

NOVEMBER, 1921

Number 7

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Published eight times a year by the Massachusetts Agricultural College  
January, February, March, May, June, September, October, November  
*Entered at the post office, Amherst, Mass., as second class matter*

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## The Ten Weeks' Winter School

AT THE

MASSACHUSETTS AGRICULTURAL COLLEGE



BOSTON

WRIGHT & POTTER PRINTING COMPANY, STATE PRINTERS  
32 DERNE STREET

1921

PUBLICATION OF THIS DOCUMENT  
APPROVED BY THE  
SUPERVISOR OF ADMINISTRATION.

## STAFF OF INSTRUCTION, 1921

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EDWARD M. LEWIS, A.M.

*Acting President of the College*

JOHN PHELAN, A.M.

*Director of Short Courses*

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<i>Professor of Agronomy</i>		
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<i>Professor of Agricultural Economics</i>		
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<i>Professor of Horticultural Manufactures</i>		
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<i>Professor of Vegetable Gardening</i>		
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<i>Assistant Professor of Rural Engineering</i>		
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<i>Instructor in General Horticulture, Superintendent of Grounds</i>		
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<i>Professor of Farm Management</i>		
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<i>Assistant Professor of Pomology</i>		
MARY GARVEY, B.Sc.	. . . . .	Microbiology
<i>Instructor in Microbiology</i>		

		DEPARTMENT
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<i>Instructor in Animal Husbandry</i>		
CHARLES H. GOULD, B.Sc.	. . . . .	Pomology
<i>Instructor in Pomology</i>		
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<i>Instructor in Physical Education</i>		
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<i>Instructor in Home Economics</i>		
CHRISTIAN I. GUNNESS, B.Sc.	. . . . .	Rural Engineering
<i>Professor of Rural Engineering</i>		
MARGARET HAMLIN, B.A.	. . . . .	Agricultural Opportunities for Women
<i>Agricultural Counselor for Women</i>		
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<i>Instructor in Vegetable Gardening</i>		
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<i>Agent for Agricultural Teacher-Training, Massachusetts Board of Education</i>		
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<i>Professor of Physical Education and Hygiene</i>		
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<i>Instructor in Agronomy</i>		
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<i>Assistant Professor of Veterinary Science</i>		
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<i>Assistant Professor of Botany</i>		
CHARLES E. MARSHALL, Ph.D.	. . . . .	Microbiology
<i>Professor of Microbiology</i>		

## DEPARTMENT

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<i>Professor of Veterinary Science</i>	
HARLOW L. PENDLETON, B.Sc.	Dairying
<i>Instructor in Dairying</i>	
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<i>Assistant Professor of Animal Husbandry</i>	
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<i>Instructor in Horticultural Manufactures</i>	
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<i>Assistant Professor of Horticulture</i>	
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<i>Professor of Animal Husbandry</i>	
EDSON SANBORN	Animal Husbandry
<i>Instructor in Animal Husbandry</i>	
DONALD W. SAWTELLE, M.Sc.	Agricultural Economics
<i>Instructor in Agricultural Economics</i>	
FRED C. SEARS, M.Sc.	Pomology
<i>Professor of Pomology</i>	
ADELBERT SHEFFIELD	Dairying
<i>Superintendent of Dairy Manufactures</i>	
EDNA SKINNER, B.Sc.	Home Economics
<i>Professor of Home Economics</i>	
RICHARD W. SMITH, B.Sc.	Dairying
<i>Instructor in Dairying</i>	

## DEPARTMENT

JAMES L. STRAHAN, M.Sc.	Rural Engineering
<i>Assistant Professor of Rural Engineering</i>	
CHARLES H. THAYER	Agronomy
<i>Instructor in Agronomy</i>	
CLARK L. THAYER, B.Sc.	Floriculture
<i>Professor of Floriculture</i>	
WESTON C. THAYER, B.Sc.	Animal Husbandry
<i>Instructor in Animal Husbandry</i>	
CHARLES H. THOMPSON, M.Sc.	Horticulture
<i>Assistant Professor of Horticulture</i>	
PAUL W. VIETS	Short Courses
<i>Supervisor Farm Placement Training</i>	
FRANK A. WAUGH, M.Sc.	Landscape Gardening
<i>Professor of Landscape Gardening</i>	
WINTHROP F. WELLES, B.Sc.	Agricultural Education
<i>Professor of Agricultural Education</i>	
T. GEORGE YAXIS, M.Sc.	Dairying
<i>Assistant Professor of Dairying</i>	

HENRY S. GREEN, A.B., LL.D.

*Librarian of the College*

# THE TEN WEEKS' WINTER SCHOOL

## January 2 to March 10, 1922

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### GENERAL INFORMATION

One. — The courses are intensive and practical, growing out of past experience. The college has maintained the winter school for twenty years.

Two. — The instruction is thorough. The regular faculty teaches the winter school classes, assisted, if necessary, by additional instructors and lecturers.

Three. — The school is held at a time when men and women can leave the farm and take advantage of this opportunity. It closes in time for the spring work.

Four. — The expenses are very moderate.

Five. — The students enjoy the winter school, not only because of the benefit received through class work, but also because of the opportunity it affords to meet and know other progressive farmers of the State.

Six. — The social life of the winter school students is well organized.

Seven. — There is no age limit to education. Young and old are enrolled in the winter school.

Eight. — There are no entrance requirements or entrance conditions other than that a student shall be eighteen years of age, and shall have completed the elementary or common schools.

Nine. — Students may select the courses in which they are interested.

Ten. — While the college does not guarantee positions, it frequently has calls for capable, energetic men and women with farm experience.

### TUITION, FEES, AND EXPENSES

There is no tuition in the winter school, but each student is required to pay to the Treasurer a \$5 registration fee. There are no laboratory fees in connection with any of the courses. The registration fee, unless sent in advance, must be paid at the time of registration to the Treasurer of the college.

Board may be obtained at the college dining hall for approximately \$7 a week. Rent for furnished rooms in private houses varies in price from \$2.50 to \$4 a week for each occupant. The new women's dormitory will accommodate 35 or 38 women in double rooms. The price per week will be approximately \$3 for each occupant.

Information regarding room and board may be obtained at the Short Course office.

### REGISTRATION

Students will be registered in classes Monday, January 2, at the Short Course office. Classes will begin Tuesday, January 3, at 8 o'clock A.M.

Upon arrival the student should report at the office of the Director of Short Courses, located in South College, telephone 424-R.

A class card will be issued by the Short Course office that must be signed by the Registrar, the Treasurer, the Director of Short Courses, and the instructors in whose classes the student enrolls. The enrollment card must be returned within three days to the Short Course office.

Students may enroll by mail by filling out the registration card that will be sent upon application. Enrollment by mail should be made early.

### RULES AND REGULATIONS

The choice of subjects is left to the student, but students are advised to elect not less than ten nor more than twenty-five hours per week. All variations from this rule must be approved by the Director of Short Courses.



A class that meets for one hour a day for five days per week is reckoned as five credit hours. A two or three hour laboratory period counts as one class hour.

Information in regard to books used in the various courses will be given by the instructors at the first meeting of the class. The necessary textbooks may be purchased at the Treasurer's office.

As a guide to those who come to the college for the first time, the following extracts are taken from the regular rules of the college:—

**The customary high standard of college men in honor, manliness, self-respect and consideration for the rights of others constitutes the standard of student deportment.**

**It should be understood that the college, acting through its president or any administrative officer designated by him, distinctly reserves the right not only to suspend, but also to name conditions under which students may remain in the institution.**

**Regularity of attendance and conformity to general college rules are required of all winter school students.**

## THE LIBRARY

The college library occupies the entire lower floor and basement of the Chapel-Library building. It contains more than 60,000 volumes in addition to a large number of unbound periodicals and pamphlets. Works on agriculture, horticulture, botany, entomology, and the various sciences predominate, but literature, history, economics, and sociology are well represented and receive due attention. In addition to a few newspapers and the best farm papers, the reading room is supplied with a good variety of popular periodical literature, encyclopedias, and general reference books. The equipment is such that the library ranks extremely well with the agricultural libraries of the country.

An agricultural reference library is maintained in Stockbridge Hall. Other branch libraries and reading rooms are provided in the department buildings, and these are open for the use of the Short Course and regular college students.

The library hours are from 8 A.M. to 9.30 P.M. every week day, and from 10 A.M. to 1 P.M. on Sunday in term time. Shorter hours prevail during the vacation season.

Short Course students should be able to find excellent material for their lines of work, and are cordially invited to make use of the library and its equipment. The librarian and library assistants are always on hand, ready and willing to be of assistance.

#### THE INFIRMARY

The college maintains an infirmary for the care of sick or injured students. Students are urged to go to the infirmary when in need of the services rendered by the resident nurse or by a physician. Inasmuch as the physical director gives special attention to all student diseases, it is to be expected that students will go to the infirmary at his suggestion.

The infirmary fee is \$2 a day, and will be charged when one or more meals are obtained at the infirmary, or when the student remains at the infirmary for one or more nights.

#### SCHOLARSHIPS

The Jewish Agricultural and Industrial Aid Society of New York instituted in 1908 a system of free scholarships to enable the children of Jewish farmers to attend the short winter courses offered by the agricultural colleges in the States in which they reside. The scholarships are awarded by competition, which consists in the writing of a brief essay on an agricultural topic. Children of Jewish farmers living and working on the farms of their parents are eligible to compete for these scholarships.

Applications for these scholarships should be made to The Jewish Agricultural and Industrial Aid Society, 174 Second Avenue, New York City.

## POSITIONS

A student desiring a recommendation from the college must meet the following conditions: —

1. He must be of good character.
2. His previous record must be good.
3. His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of farm experience cannot, as a rule, be recommended for positions of responsibility. This is especially true for the better positions for which managers or superintendents are wanted.

## DESCRIPTION OF COURSES

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### GENERAL AGRICULTURE

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#### 1. Soil Fertility

A course in which the origin of soils, their properties and management, will be studied. Emphasis will be placed on: the control of soil moisture; tilth and tillage; importance and maintenance of soil organic matter; manures, — their composition, value, preservation, and use; and the properties and use of commercial fertilizers. Two lectures and one two-hour laboratory period.

*Mr. Thayer and the Department*

#### 2. Field Crops

The production of field crops for New England; species and varieties, agricultural characteristics, methods of culture, rotations, harvesting and curing. The laboratory work gives the student practice in seed selection and testing for quality, purity and germination, and in corn and potato judging. Course 1 required. Two lectures and one two-hour laboratory period a week.

*Assistant Professor Michels and the Department*

#### 3. Types and Breeds of Live Stock

Outlines of the market classes and grades of beef cattle, horses, sheep, and swine, placing emphasis upon the characteristics of each class and its adaptations. The characteristics, the adaptations, and so far as is possible the historic development of each of the more



A class in field crops



Winter school students pruning trees



important breeds of livestock are also carefully studied, as well as their distribution in America. Special emphasis is laid upon dairy cattle and horses in the judging work. Three lectures and two two-hour judging periods a week.

*The Department*

#### **4. Live Stock Feeding**

A study of the physiology of nutrition, the composition of feed-stuffs, and of rational economic feeding. The feeding of dairy cattle and their management for profitable milk production receives first attention. Similarly, the feeding of horses, of beef cattle, of sheep, and of swine is studied. Three lectures a week.

*The Department*

#### **5. Animal Breeding**

A discussion of the more common problems pertaining to the breeding of livestock, their explanation and solution; in-breeding; cross-breeding; grading. The work of the most successful men in history is studied. Time is given to the study of pedigrees of the different breeds of dairy cattle and other stock. One lecture and one two-hour laboratory period a week.

*The Department*

#### **6. Dairying**

(a) Testing milk and milk products: composition and properties of milk, Babcock test for fat, tests for acidity; moisture and salt in butter. Two lecture hours, one two-hour laboratory period.

(b) Manufactures: study of separators, separating, ripening cream, making starters, making butter, and making cottage cheese and other soft cheese. Two lecture hours, two three-hour laboratory periods.

(c) Market milk: a study of market milk conditions, production, care and handling; various types of dairy buildings. One lecture hour, one three-hour laboratory period.

(d) Dairy arithmetic: problems of the dairy. One two-hour laboratory period.

*Assistant Professor Yaxis*

NOTE. — Dairy students are required to take (a), (b), (c), and (d), also the course in dairy bacteriology; (a) only, open to other students.

## **7. Dairy Bacteriology**

The characteristics and functions of bacteria and their relation to the different branches of the dairy industry. The scientific basis for cream ripening, sterilization, pasteurization, control of fermentation, and the production of the best quality of market milk. Two lectures and one two-hour laboratory period a week.

*Professor Marshall and Miss Garvey*

## **8. Animal Diseases and Stable Sanitation**

Lectures upon some of the common diseases of livestock, giving special attention to methods of prevention, care, and sanitation; the treatment of emergencies and accidents; how to keep animals healthy. Two lectures a week.

*Dr. Lentz*

## **9. Poultry Husbandry**

This course meets the needs of those who can spend only a short time at the college, but who wish to get a general survey of poultry keeping and some technical knowledge of the latest and most scientific methods in vogue. It is a lecture and laboratory course, the former covering opportunities in poultry culture, poultry housing, winter egg production, incubation and brooding, feeds and feeding, poultry management, and the most popular methods of marketing poultry and eggs in Massachusetts. The laboratory work consists of demonstrations and practical work in killing, picking, caponizing, judging and culling for egg production, and studying types and construction of incubators and brooders. Prac-



tical work in operating incubators is given to as many as can be accommodated. The large poultry plant furnishes facilities for demonstrating various methods of housing and feeding. A splendid opportunity is afforded those who have time for observation work outside of class hours. Five lectures and one two-hour laboratory period per week.

*Poultry Department*

### **10. Fruit Growing**

This course deals with the practical side of the growing and marketing of fruits. Especial attention is given to such questions as selection of site for the plantation, choice of varieties, grafting and budding, spraying, pruning, cultivation and cover crops, fertilizing the fruit plantation, packing and marketing. Lectures, supplemented by demonstrations, and whenever possible, actual work by the student. Students electing Fruit Growing are also required to take Course 1, and it is recommended that they take Courses 18 and 19. Three lectures and one two-hour laboratory period a week.

*Mr. Gould*

### **11. Vegetable Gardening**

This course is to help the student understand the everyday problems that confront the men who are engaged in the commercial production of vegetables.

These include matters relating to the soil, the seed, the seedling, the plant, the product, and the plan or the equipment and organization of the business for most efficient results.

Studying actual materials and performing various operations in the laboratory and greenhouses is made an important part of the course. Prospective students are urged to bring their actual problems to the classroom for study and discussion.

Students electing this course are required to take Course 1, and it is recommended that they take Courses 18 and 19. Three lectures and two two-hour laboratory periods a week.

*Mr. Harris*

## 12. Floriculture

This course is outlined primarily for students who are interested in commercial floriculture. Some of the subjects considered are: greenhouse construction and heating, greenhouse management, culture of the important commercial crops, and floral arrangement. A portion of the course will be devoted to a consideration of gardening and garden flowers. Special trips are taken to study floricultural establishments in the State; students desiring credit for the course are required to take these trips. Students taking this course are required to take Course 1, and it is recommended that they take Courses 10 and 11. Five lectures a week; laboratory work or field trips on Saturday.

*Department of Floriculture*

## 13. Horticultural Manufactures

The utilization of culls and low-grade fruits and vegetables, and the marketing of excess crops are always serious problems to the producer. The economic conversion of these materials into palatable nutritious food products is becoming a greater necessity each year.

This course aims to place before the student the fundamental principles underlying the various means of food preservation and the manufacturing of food products.

The canning, drying, and storage of fruits and vegetables, together with the manufacture of many of their products, will be studied in detail, and the methods illustrated with laboratory exercises. Students will be given opportunity to do canning and drying, to manufacture many fruit and vegetable products, and to investigate storage conditions. The work in both classroom and laboratory will be of such a character as to be readily applied in the home or in the farm factory. Two lectures and two laboratory periods per week. Class limited to sixteen students.

*Professor Chenoweth and Mr. Robertson*

#### 14. Farm Management

A study of some of the problems of modern farming and the factors that influence success, such as the choice of a region and of a farm, types of farming, size of farm, rotation of crops, and labor problems. Two lectures a week.

*Professor Foord*

#### 15. Farm Accounts

Actual practice in the use of a simple system of farm accounting, including cost accounts suitable for the large or the small farm. Two two-hour laboratory periods a week.

*Professor Foord*

#### 16. The Supply and Marketing of Farm Products in Massachusetts

The course will attempt to show what products New England can most profitably produce and how and when they can best be marketed. The principles of marketing, the importance of marketing as compared with production, the best outlets for sale, proper methods of preparation, packing, shipping, storing, advertising and selling, direct marketing, use of motor truck, trolley freight and express, collective selling, planning production with a view to marketing, will be some of the topics presented. Each student will be given an opportunity to study the market for some product in which he is interested. Twenty lectures.

*Department of Agricultural Economics*

#### 17. Sources and Use of Agricultural Credit

The course deals with the need, the sources, the methods of obtaining farm capital in New England. When and when not to borrow; length of loan, methods of payment, interest, amortization, loan asso-

ciations, Federal land banks, mortgage credit, personal loans, collateral, and like practical topics are discussed. Safe and unsafe securities, notes, bonds, stocks, and investments are discussed. Twenty lectures.

*Mr. Sawtelle*

### 18. Botany

A study of the structure, functions, and diseases of greenhouse, garden, orchard, and field crops, together with methods of disease prevention, including spraying and the application of fungicides. Two lectures a week.

*Assistant Professor McLaughlin*

### 19. Entomology

The Course in Entomology covers the topics outlined below. It is aimed to cover the fundamentals of the subject rather fully. Time will permit the discussion of only the more important of the injurious and beneficial insects with which we have to deal in this section of the country.

1. Insects and their nearest relatives — how to distinguish them.
2. Structure or make-up of insects and the practical application of this knowledge in insect control.
3. Development, metamorphoses (changes), and stages of insect life.
4. Composition, preparation, combination, and use of insecticides, fumigants, etc.
5. Spraying apparatus and its use.
6. Beneficial and injurious insects.

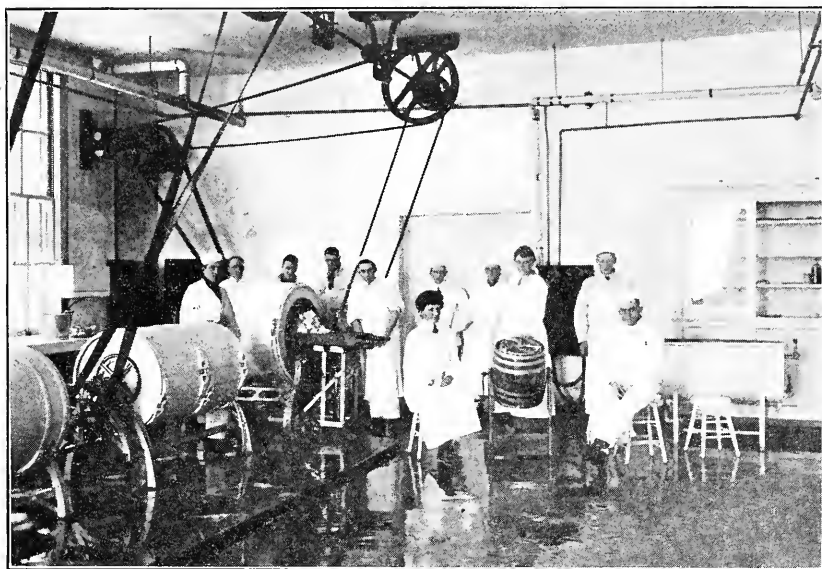
A. The life history, habits, behavior, and control of some of the most important insect pests of —

- (1) Orchard and small fruit pests.
- (2) Market garden and field-crop pests.
- (3) Greenhouse pests.
- (4) Forest and shade-tree pests, and pests of ornamental plants.
- (5) Domestic animal pests.
- (6) Household pests and those attacking man.
- (7) Insects and their relation to the transmission of disease; *i.e.*, how insects affect public health.

B. Beneficial insects.

Three lectures a week.

*Associate Professor Regan*



Winter school students making butter



Laboratory work in the vineyard



## 20. Farm Structures

A study of design and arrangement of farm buildings, including the general purpose barn, dairy stable, horse barn, milk house, ice house, root cellar, etc.; building materials used in farm construction; heating and lighting systems and road construction.

Working drawings of farm buildings will be prepared, a complete set of drawings being worked up by each student from any design problem he may select. Practice will be given in handling Portland cement concrete in the rural engineering shop where ample facilities are available. Two lectures and three two-hour laboratory periods per week.

*Assistant Professor Strahan*

## 21. Farm Motors

This course deals with the gasoline engine as used for stationary work, automobiles, and tractors. Instruction is given by means of lectures and textbooks, and by operating and repairing stationary engines, automobiles, and tractors. Special attention is given to overhauling and repairing. Three class hours and two two-hour laboratory periods a week. Credits, 5.

*Professor Guinness and Mr. Denman*

## 22. Rural Sanitary Science and Hygiene

Significance of sanitary science in the relation to health; the theories of disease; air and ventilation; water and its protection; sewage, disposal and purification; foods, their care, preservation, decomposition, and nutrition; vaccines and serum treatment; carriers of disease, immunity, and susceptibility; infectious diseases; disinfection and care of infectious diseases. Two lectures a week.

*Professor Marshall*

### **23. Agricultural Opportunities for Women**

Agriculture is a field in which women are finding increasingly good opportunities.

The particular problems which the women engaged in farming will have to meet, and the special lines of farming in which they will have favorable opportunities, will be considered in a series of conferences. Two class hours per week.

*Miss Hamlin*



## HOMEMAKING

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Owing to the increasing demand for instruction in homemaking, provision has been made in the winter school for a course combining homemaking with agriculture.

There are many women and girls throughout the State who are vitally interested in studying home problems and at the same time would like to become proficient in some phase of agriculture, as poultry, gardening, floriculture, or fruit growing. The college is able to extend this unusual opportunity.

Attractive laboratories equipped for homemaking work will be at the disposal of all women students in the winter school.

### 24. Foods

When one realizes that on an average about 30 or 40 per cent of the family income must be spent for food, it is easy to understand that this is one of the most timely topics of the day in the interest of thrift and health.

Special study will be made of the needs of the body and the selection of foods to supply those needs; also care in the handling and keeping of foods. Emphasis will be given to the application of fundamental principles in planning balanced menus. An unwise selection of foods may result in malnutrition rather than in health.

Consideration will be given also to such special problems as infant feeding and school lunches. This course will include laboratory work of practical value. Two lectures and two two-hour laboratory periods per week.

*Miss Grizzle*

## 25. Clothing

Consideration will be given to making over and extending the use of fabrics as well as the selection of new materials. Their character, cost, and durability are studied with reference to planning a wardrobe for a limited income, emphasizing the beauty of simplicity and suitability. There will be practical work in sewing and making garments. Two lectures and two two-hour laboratory periods per week.

*Miss Grizzle*

## 26. The Business of the Household

Good management is a science. For generations women have failed to apply to the business of homemaking many efficient methods so successfully used in the business world.

Since the homemaker is largely responsible for all expenditures connected with the house, an important consideration in this course is the study of the family budget, the apportionment of the income, and the keeping of accounts.

Equally important is the standardization of household tasks, the study of systematic methods of work, selection and care of equipment, the use of time and labor-saving devices. Three class hours per week.

*Miss Skinner*

## 27. Home Care of the Sick

Health preservation and home care of the sick are of prime importance. It should be far easier to keep well than to become sick, provided one understands the fundamental principles of hygiene, thus insuring the care of family health.

Every homemaker needs some knowledge of home care of the sick, including the study of simple diseases and their prevention, the care of young children and invalids, and first aid to the injured. Three class hours per week.

*Miss Skinner*

## VOCATIONAL AGRICULTURAL TEACHING

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The Massachusetts Agricultural College has been designated by the Massachusetts Department of Education as the institution for training teachers of vocational agriculture for the State. The work is being carried along the following lines: —

1. Regular college courses, four or five years, leading to a degree.
2. Shorter courses to supplement the training of more mature men who are partly qualified through practical experience, or through scientific study of agriculture, or through study of methods and principles of education, or through teaching experience.
3. Professional improvement training for employed teachers in regular college courses, or courses in the winter term, or courses specially organized on request of a sufficient number of students.

The Winter Short Course period provides in part for the second and third lines. An intensive course during the first two weeks is provided for the instructors who may leave their teaching for only a brief period. This course may be continued on a lighter schedule for such persons as may be able to remain throughout the winter term.

For all of these there will be an opportunity to take courses in general agricultural teaching, special Massachusetts problems, and agricultural subject-matter. An attempt will be made to furnish any subject-matter course which enough men may request.

High school principals and science teachers who have had farm experience, or practical agriculturists, may find this an opportunity to qualify for vocational teaching, — a field in which the demand is fairly strong.

The educational courses supplemented by an adequate amount of agriculture will be credited by the Department of Education towards approval of candidates or for professional improvement programs. Similar courses are offered in the summer school.

The following courses have proved to be of greatest benefit to those enrolled at this time: —

### **Principles and Methods of Teaching**

The aim of this course is to present the fundamental principles of teaching as applied to high school students. It treats such topics as interest, apperception, imaging, reasoning, and other activities of the mind in its learning processes, and endeavors to apply the study of these in each student's case in order that he may learn to promote such mind activities in others. Such matters as discipline, lesson plans, teaching efficiency and other topics of general method are thoroughly handled and illustrative work done. Five exercises per week.

*Professor Welles*

### **Special Methods in Vocational Agricultural Teaching**

This course consists of intensive work on the important principles underlying the successful teaching of vocational agriculture and a thorough study of the special plans and activities of the teacher of this subject. The job is analyzed to determine what the teacher must know as to character, setting, technique, and relations of his work. All available sources are consulted for information as to State requirements, industrial conformity, and professional ideals. Illustrative material showing how particular departments and schools work out their problems in this subject is gathered and studied. Plans for the year's work, unit study and daily lessons are worked out on the home-project basis. Special lessons are planned and taught by students in moot class.

In case both experienced and untrained men apply for this course, the group may be divided into two sections. Five exercises per week.

*Professor Welles*

### **Professional Improvement Problems**

A seminar course for employed teachers or directors of vocational agriculture, dealing with problems which constantly arise in the agricultural schools of the State. Prospective teachers may be admitted by special arrangement. Includes plans for the coming season, and campaigns for improved methods based on experiences and needs of men in service; for this season special emphasis on summer teaching of related subjects, and the proper approach to teaching a vocational topic.

Under special arrangement of the Massachusetts Department of Education and the Massachusetts Agricultural College, students in this course may be admitted to Professor Welles' class in principles and methods of teaching.

Class meets for double periods five days each week for two weeks. May be continued, on request, for a longer term at four days each week.

*Mr. Heald*

### **Seminar Course in Agricultural Education**

This course is designed primarily for graduate students. The work is planned for persons holding supervisory positions, such as principalships, superintendencies, directorships, etc., as well as for teachers who are looking forward to such advanced positions. Such topics will be taken up for investigation as will meet the needs of the group electing this work. Such subjects as organization, supervision, and administration of agricultural schools and vocational education are included.

Students who are eligible to the graduate school of the Massachusetts Agricultural College may receive credit towards an advanced degree for this work if their undergraduate studies in education warrant it. By arrangement.

*Professor Hart*

## **NURSERY PRACTICE — PRACTICAL AND SCIENTIFIC COURSE FOR NURSERYMEN**

**January 2 to March 10, 1922**

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A special course for men engaged in nursery work will be given by the Massachusetts Agricultural College beginning January 2 and running through a period of ten weeks, closing March 10, 1922. This course has been provided at the request of the New England Nurserymen's Association and is under the immediate direction of the standing committee on education of that society. The plan has the further support and co-operation of the Massachusetts Nurserymen's Association.

### **General Plan**

This course of ten weeks will follow the same general plan as the Ten Weeks' Short Course long maintained by the Massachusetts Agricultural College. It will, in fact, be a part of this regular winter school, the students in the Nursery Course having all the advantages and privileges of the old-established course, but with studies especially adapted to the needs of nursery workers.

### **Program of Studies**

The work as outlined by the committee on education of the Nurserymen's Association and scheduled for the coming term is as follows: —

1. Horticultural botany, the identification of plants, their correct names, the science of nomenclature, etc., by Assistant Professor C. H. Thompson.
2. Soils and fertilizers, covering the origin of soils, soil types, soil moisture, tillage, organic matter, humus, fertilizers, home-mixing, etc., by C. H. Thayer.



**Nursery practice**





## THE ONE-YEAR VOCATIONAL COURSE IN POULTRY HUSBANDRY

January 2 to December 22, 1922

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**Enrollment in the Vocational Poultry Course is limited to twelve students. Applications for this course should be made early.**

The institution of the One-Year Vocational Course in Poultry Husbandry is to meet the needs of those who wish to specialize in this branch of agriculture and devote practically all of their time to it, and who feel they cannot spend either two or four years in college.

*Entrance Requirements.* — Applicants must be at least eighteen years of age and have a good elementary education.

*Fees.* — There is no tuition for residents of Massachusetts, but a laboratory fee of \$5 is required for the spring term, and the same for the fall term.

The material for this course has been carefully selected from the various courses for the four-year students. Use is made of the very practical portions, but enough of the more scientific work is given to enable the student to get a thorough grasp of the “whys and wherefores” of the subject. The former has been much enlarged upon, and an immense amount of practical laboratory work in care and management of poultry is required. “Learn to do by doing” is the slogan for this course. The aim is to develop as much skill as time will permit.

The general plan is as follows: —

*Winter Term.* — The student takes Course 1, outlined below, and in addition, farm accounts, avian pathology, agricultural economics, poultry husbandry, rural sanitary science, and hygiene. The student may elect either fruit growing or vegetable gardening. This plan

brings the student in contact with other members of the faculty, and acquaints him with important correlated work.

*Spring Term.* — From approximately April 4 until college closes, in June, the student takes Courses 1, 4, 5 and 7, devoting all his time to poultry work.

*Fall Term.* — The student continues Courses 1, 5 and 7, and in addition takes Courses 2 and 3, still devoting all his time to poultry work.

### Course of Study

*Course 1. Elementary Poultry Keeping.* — A textbook course supplemented with lectures, recitations, etc., covering the entire field of elementary poultry keeping, special emphasis being laid upon the following subjects: opportunities in poultry keeping, poultry house construction, feeds and feeding, breeds and breeding, incubation, brooding, growing stock, poultry farm management, and poultry diseases. Five recitations per week throughout the year.

*Course 2.* — A practical laboratory course covering the following subjects: carpentry, fattening, killing, picking, dressing, caponizing, avian anatomy and physiology, making and applying disinfectants and lice powder, also identification and study of poultry feeds, etc. Two laboratory periods per week from October until December, inclusive.

*Course 3. Poultry Judging.* — Fall term. This course embodies the latest methods of judging egg production capacity by external characters as approved by the American Association of Instructors and Investigators in Poultry Husbandry; the history and evolution of our breeds and varieties of domestic fowl, their standard qualities, and their preparation and judging for exhibition purposes. In the latter portion of the course the "American Standard of Perfection" is used as a text. Two two-hour laboratory periods.

*Course 4.* — A practical laboratory course in incubation, brooding, and growing stock, equivalent to five laboratory periods per week from March to June, inclusive.

*Course 5.* — A conference, observation, and general reading course equivalent to one or two recitations per week during the fall and spring terms. In this course the student will become thoroughly acquainted with the best literature on poultry subjects through books, station bulletins, scientific articles, poultry magazines, etc. A thorough discussion of the problems met by the practical poultrymen is a strong feature of this course.

*Course 6. Poultry Management.* — A general poultry practice course in the care and management of poultry, the work to be done morning, noon, and night, and other periods as necessity requires, the class to be responsible for the work in caring for specified flocks under the supervision of instructors from April until college closes, and from October until December inclusive.

*Course 7. Elements of Poultry House Designing.* — This course embraces the elements of mechanical drawing and the principles of designing; and special attention is given to the preparation of plans for all kinds of poultry buildings, including incubator cellars, brooder, laying, breeding, and growing houses; also feed hoppers, trapnests, and other equipment. Two two-hour laboratory periods per week. Credits, 2.

*Department of Rural Engineering*

## THE TWO-YEAR COURSE IN PRACTICAL AGRICULTURE

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The Two-Year Course in Practical Agriculture was organized in 1918. It is intended to give men and women who do not possess college entrance requirements an intensive practical preparation that will prepare them for farm pursuits.

The demand for this course has steadily increased. In 1918, 38 students were enrolled. The enrollment for 1919-20 was 324.

The first year of the course consists of six months of study at the college, and six months' practical farm experience on selected farms.

During the second year the student spends nine months in resident study, and on completion of the course receives a certificate showing the subjects he has taken during the period of residence.

The growth of the course has made it necessary to subdivide into groups of studies, in order that there may be more intensive specialization. As it is now organized, there are specially arranged courses in animal husbandry, poultry, dairy manufactures, general horticulture, pomology, floriculture, and vegetable gardening.

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## THE SUMMER SCHOOL

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The 1921 summer school was under the joint direction of the Massachusetts Agricultural College and the Division of Elementary and Normal Schools of the State Department of Education. Courses in agriculture, horticulture, and education were offered. It is expected that this plan of co-operation will be continued during 1922.

## DIRECTORY OF INFORMATION

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### A. The College

Those desiring college catalogues, the President's annual report, and other pamphlets giving full information relative to entrance requirements, courses of study, expenses, opportunities for student labor, and so forth, should address Ralph J. Watts, Secretary, Amherst, Mass.

All questions regarding admission to the college, either to the freshman class or to advanced standing, should be addressed to Professor P. B. Hasbrouck, Registrar, Amherst, Mass.

### B. The Experiment Station

The Experiment Station conducts investigations in as many lines of agricultural science and practice as its funds will permit. It has charge of the inspection of commercial fertilizers, commercial feeding stuffs, and milk-testing apparatus. Branch stations in cranberry and asparagus culture are maintained in other sections of the State.

The station considers the farmers' problems to be its problems, and desires to keep in touch with them.

Requests for bulletins reporting the results of experiments and inspections, and for other information on the work of the station, should be addressed to Sidney Haskell, Director of the Experiment Station, Amherst, Mass.

### C. The Graduate School

Questions relating to courses offered leading to the degrees of Master of Science and Doctor of Philosophy, admission and work required, should be addressed to Dr. Charles E. Marshall, Director of the Graduate School, Amherst, Mass.

### D. The Extension Service

Inquiries of a general nature regarding the work of the Extension Service, extension publications, or requests for new lines of work should be addressed to John D. Willard, Director of Extension Service, Amherst, Mass.

### E. Short Courses

For information concerning the Short Courses, the Two-Year Course in Practical Agriculture, the Ten Weeks' Winter School, the summer schools, write or apply to John Phelan, Director of Short Courses, Amherst, Mass.



# THE MASSACHUSETTS AGRICULTURAL COLLEGE

## TEN WEEKS' WINTER SCHOOL

### Application for Enrollment

I hereby make application for admission to the Ten Weeks' Winter Courses which are to begin Jan. 2, 1922. I am enclosing the registration fee of five dollars (\$5) in cash, check, or money order. (Designate which one.)

Name (Mr., Mrs., or Miss).....

Home address .....

Date of application.....

My choice of courses is as follows: —

1. .... 3. .... 5. ....

2. .... 4. .... 6. ....

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Mail this blank, enclosing fee, to John Phelan, Director of Short Courses, Massachusetts Agricultural College, Amherst, Mass. Checks or money orders should be made payable to the Massachusetts Agricultural College.









